News of the Industry Begins Page 916

DEC 29 1927

AUTOMOTIVE INDUSTRIES

Volume 57
Number 25

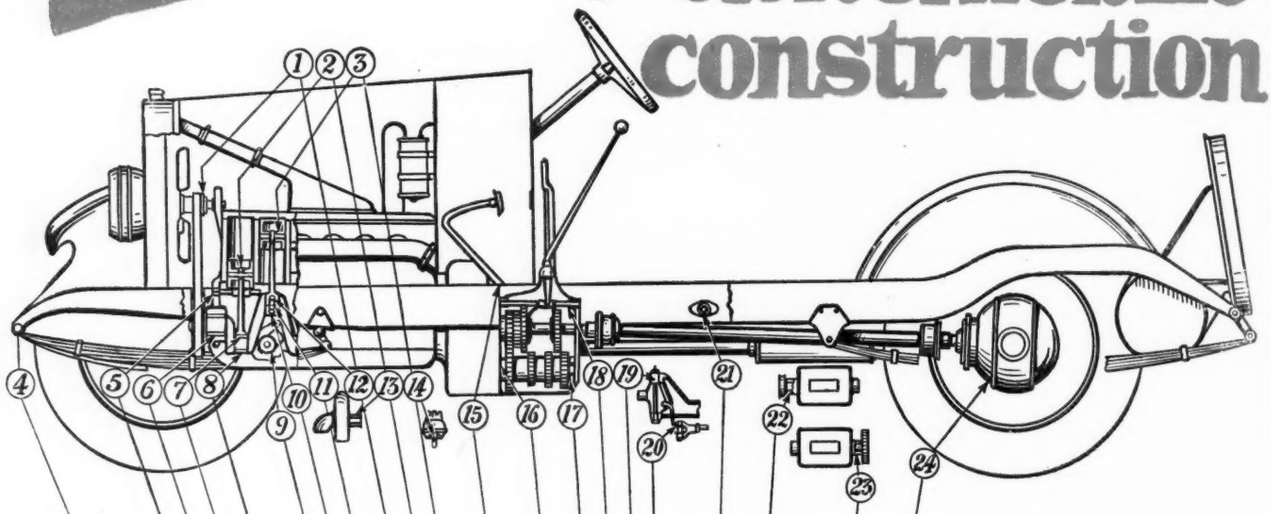
PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, DECEMBER 17, 1927

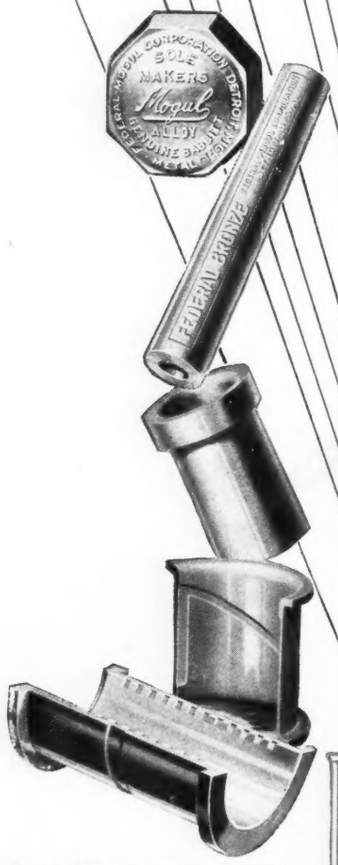
35c a copy
$3.00 a year

THE Strikingly Beautiful new mode of exclusive body fittings, has been made possible solely by the designing and manufacturing talent, which Ternstedt has carefully selected and trained to meet the exacting demands of motor car interior decoration.
Harmonized Interior Fittings by TERNSTEDT Will Be a Powerful Sales Factor of Motor Cars in 1928
TERNSTEDT
Designers and Makers of the World's Finest Body Fittings
DETROIT U S A
ARTIST ENGINEERS
DESIGNERS
MODELERS
DIE CHASERS

Entered as second-class matter Oct. 1, 1926, at the post office at Philadelphia, Pa., under the Act of March 3, 1879

24 opportunities *for* better automobile construction





FEDERAL-MOGUL Bearings, Bushings and other related products have 24 important applications in practically every motor car built. Wherever used, they minimize friction and wear. They insure for the manufacturer who uses them, a reputation for long-lived, trouble-free service. More than 150 automotive manufacturers specify them as standard equipment. Complete research laboratory facilities are available for co-operation with automotive engineers.

FEDERAL-MOGUL CORPORATION
Detroit, Michigan

Key to Drawing

1. Fan Pulley Bushing
2. Connecting Rod Bushing
3. Piston Pin Bushing
4. Spring Eye and Shackle Bushing
5. Camshaft or Eccentric Shaft Bearing or Bushing
6. Main or Crankshaft Bearing
7. Connecting Rod Bearing
8. Bearing Anchor Screws
9. Steering Gear Eccentric Bushing
10. Connecting Rod Nut
11. Connecting Rod Shim
12. Connecting Rod Bolt
13. Water Pump Bushing
14. Distributor Bushing
15. Brake Pedal Bushing
16. Transmission Intermediate Shaft Washer
17. Transmission Intermediate Shaft Bushing
18. Transmission Shift Fork Shaft Bushing
19. Steering Knuckle or King Pin Bushing
20. Steering Knuckle Tie Rod Bushing
21. Brake Cross Shaft Bracket Bushing
22. Generator Bushing
23. Starter Motor Bushing
24. Brake Actuating Camshaft Bushing

The Complete Federal-Mogul Line Includes

Bronze-Back, Babbitt-Lined Bearings
Die-Cast Babbitt Bearings and Bushings
Bronze Bushings
Bronze Washers
Bronze Castings
Babbit Metals
Bronze Cored and Solid Bars

Mogul FEDERAL

Licensed Under Letters Patent of the United States No. 1,455,939; No. 1,302,584; No. 1,302,838; No. 1,340,337.

Your Reputation is Safe with Federal-Mogul—World's Largest Engine Bearing Manufacturers.

AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, December 17, 1927* NUMBER 25

Two-Car-Family Market Needs Factory Development

Dealers should be shown how they can add to registrations in their territories by selling more than one car to a family. Present low resale value an aid.

ALTHOUGH everyone is more or less acquainted with the possibilities of the two-car family market, it strikes at least one observer of factory sales promotion material that not nearly enough effort has been made to show dealers just how they can add to registrations in the territories by selling more than one car to a family.

The need for intensive development of this outlet for motor car sales is becoming increasingly acute. It is obvious that a very large percentage of families able to own automobiles have been sold. Why not, then, face the fact and guide sales policies accordingly?

In this present era of high-pressure selling methods, when industry competes with industry for a larger share of the consumer's dollar, every possible source of buying has to be cultivated to the utmost. Applied to our own industry, this logically means selling more cars to a family, and factories and dealers can advantageously cooperate on a program with such an end in view.

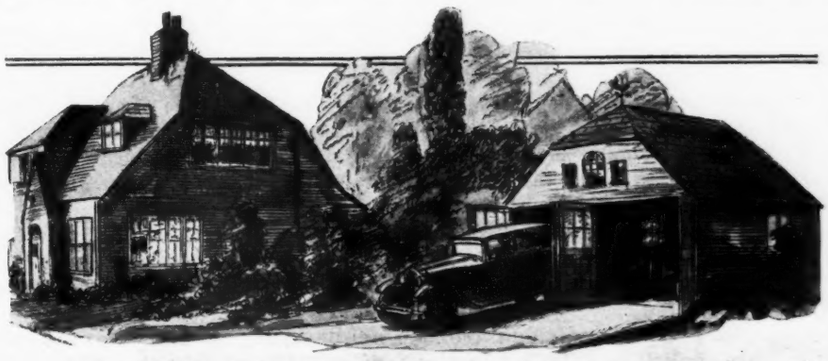
As to the present number of families owning two or more cars, the National Automobile Chamber of Commerce last April published a survey indicating a total of 2,700,000 such families. There is reason to believe that this number is too high, and the market possibilities therefore greater.

The basis for the conclusions of the chamber was a survey by the General Federation of Women's Clubs which gave the proportion of families owning motor cars as 55.7 per cent, or 15,317,500 out of 27,500,000 in the United States. As the finding was the result of a personal canvass of more than 4,000,000 families, it should be reasonably accurate, assuming that a fair cross-section of the country was taken.

After allotting one automobile to a family, and subtracting 1,140,000 cars owned by business houses, there remained 2,779,500 cars unaccounted for. This was obviously the total owned by families with more than one car. In an effort at a closer check, the chamber issued 20,000 question cards to a random list of motor owners in 10 widely scattered states.

The replies to these averaged 30 per cent of all motor-owning families with more than one automobile. It was justly felt, however, that this proportion was much too high not only in view of the findings of the women's clubs but because of the greater tendency of the multiple-car families to reply to the questionnaire. Consequently, as precise data could not be obtained, the chamber could do no more than guess at how many families owned two cars and how many more than two.

If an appreciable percentage own more than two, the number at the two-car level is correspondingly reduced. It was interesting to note that of the families informing the chamber of more than one-car ownership, 26 per cent had more than



In most fairly well-to-do suburban communities it is becoming increasingly the fashion to build houses with garages for two or more cars and less garage space is becoming hard to sell

two cars. The average for these families was 3.7 each.

Ordinary observation will confirm the view that actually the number of families owning more than two cars is rather large. In most fairly well-to-do suburban communities it is becoming increasingly the fashion to build houses with garages for two or more cars and less garage space is becoming hard to sell. The situation on the farms is even more striking, as apparently a farmer does not need a very large area of land under cultivation to find need for several cars.

The large fleets of pleasure cars owned by the very wealthy families are, of course, without direct significance to the rank and file of dealers, but all along the line, from multi-millionaire to small wage-earner, the disposition is to own more cars. The late Payne Whitney, with a fleet reputed to number 35 cars, was not a prospect for many dealers, but there are millions of others who might have two or three cars if properly sold.

One or more good reasons why there should be two or more cars in the family can always be suggested in conversation with a prospect by a dealer or salesman able to exercise a little tact. A good salesman thereby can often sell a man a new car and at the same time persuade him to keep the old one.

8 *Arguments for an Extra Car*

ONE or more good reasons why there should be two or more cars in the family can always be suggested in conversation with a prospect by a dealer or salesman able to exercise a little tact. Among the reasons that may be cited are:

1. One for father's business, one or more for family.
2. One or more for rough usage on the farm, one for going to town.
3. For school and for family.
4. Good cars at low prices make two available for the former price of one.
5. All adults in family need individual car.
6. Cars for different pleasure purposes, such as sports and formal social events.
7. Indulgent parents find younger generation monopolizing use of car.
8. Old car worth more to user than at resale.

In this way the present low resale value of cars can be made a blessing in disguise. The man with a used car to trade is usually voluble in his protestations that the job has been maintained in top-notch condition and is as good as it ever was. The reply is, of course, that the resale value of a used car is largely determined by its age and that consequently the car is worth less in the market than its unused transportation would justify.

Even if the prospect does not accede to this or to other arguments, something may have been clipped off his expectation of an allowance, and if the trade has to be made it may be on a better basis. But how happy the dealer who can put over a clean deal! Not only is there more profit for his new and used car business, but more work for his service department.

A family that feels the need for more than one car is naturally going to spend more on motor transportation, service and supplies than a one-car family. There is immediate benefit to the trade and industry, for the multi-car family is going to feel less need for other outlets for surplus funds. The automobile's proportion of the consumer's dollar has become automatically larger.

There has been much discussion of individual transportion, in connection with the automobile, but in fact it largely has been family transportation. Only in the rather small minority of families owning more than one car has there really been individual transportation. Low prices now bring within the realm of possibility multi-car ownership for a large proportion of the perhaps 14,000,000 families owning only one car.

Of course in the large cities, due to traffic conditions and the excessive expense of garaging, there is a definite restriction on ownership of more than one car, but this certainly does not hold true of the suburban and rural districts, where, in any event, most of the car owners are living.

In the smaller communities, on the other hand, there is not only definite utility in cars but a growing prestige surrounding the ownership of more than one. A sedan for all purposes is not now considered sufficient, but a family must have a sport car for going to the country club, the beach or lake and for country trips when the weather is good, while the closed car is retained for going to town and driving generally in bad weather.

The appeal to pride or vanity, therefore, is becoming increasingly forceful and here again the smart and tactful dealer is presented the opportunity for special sales effort.

The dealer, furthermore, does not have to wait for a prospect to walk into his salesroom before launching a drive to sell another car to a family. If he knows his neighborhood, and watches the new construction and the new house-owners, he will probably know of garages built for two or more cars that are housing only one. Here is an open invitation to step in with a sales talk.

It is in the light of the vast potentialities of the multiple-car market that talk of saturation points loses a part of the significance attached to it in the past. Less is heard of these doleful predictions these days. As a matter of fact, assuming a continuing advance in the prosperity of the country, the main obstacle to heavy further increases in registrations lies mainly in highway traffic. It is not the ability to own cars but the ability to get economical and pleasureable use out of them that is going to determine the approximate point of limitation of the market, assuming that the industry takes the proper steps to develop wider ownership along the lines indicated.

There is no doubt that inability to park cars in the business sections of large cities, and the slowing up of motor transportation in congested districts, restrict the utility of motor cars for the business man who might otherwise use them daily. This condition affects only a very few of the cities, however, as in most the parking problem is being met to a large extent by parking areas which may be used for a nominal payment. But in any event the promotion of traffic relief is mainly the problem of the factories and the trade associations, while selling the multiple-car family market is the dealer's job. Aid to the dealers in this respect ought to be one of the most effective directions that sales promotion could take these days.

Used Car is "*Stormy Petrel*" of Instalment Selling

Dealer repossessions of new cars are and always have been insignificant, says Prof. E. R. A. Seligman in new book dealing with automobile time sales.

By John C. Gourlie

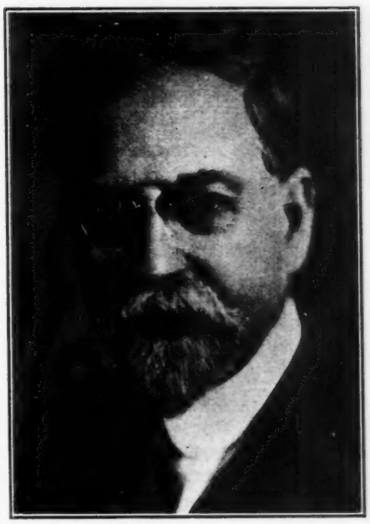
A WEALTH of hitherto unpublished material bearing not only directly upon time sales of automobiles but also on many other phases of motor car distribution and manufacture is presented by Prof. E. R. A. Seligman in "The Economics of Instalment Selling," just published in two volumes by Harper & Bros.

The general results of this investigation are fairly widely known, having been given in some detail by Prof. Seligman at the recent dinner in his honor. The data upon which the author bases his conclusions are now available, and they cover a broad field, as Prof. Seligman found early in his inquiry that properly to interpret the phenomena of time sales and repossessions he would have to delve deeply into the automobile dealers' business in new and used cars.

Responsibility for nearly all the difficulties experienced in automobile instalment selling is placed squarely on the used car. "The dealer repossessions of new cars are and always have been quite insignificant," writes Prof. Seligman. As this part of his study concerns only General Motors dealers reporting to the General Motors Acceptance Corp., he does not consider repossessions by finance companies.

The number of used cars repossessed per dealer reached a high point of 7.2 in 1925 and the indications were that this would be exceeded in 1926. New car repossessions averaged only 1.24 per dealer in 1925. In the dealer's used car sales "he is constantly induced to sell a car for more than he considers it is worth, since he has often allowed more than his estimate of its real value when he accepts it in trade."

Thus follow more repossessions, if other factors were not present. However, Prof. Seligman found that the lower the price paid for a car, new or used, the greater the tendency toward repossession. Furthermore, as the price goes up, the proportion of time sales decreases, as is shown by Table 1, the letters standing for lines of General Motors cars, with the lowest-priced at the top.



Prof. E. R. A. Seligman

The figures in this table (page 892) indicate, therefore, that while the General Motors averages should give a good indication of the proportion of time sales for nearly the whole of the industry, the percentage might be quite a bit higher if figures on Ford sales were included.

Of extraordinary interest are the results of study of the dealers in one General Motors line in the effort to widen knowledge of used car allowances and losses. It was found, for instance, that the allowance made on used cars accepted in trade by this group of dealers varies from an average of $535 in the Denver area to $381 in the Cincinnati area. The average loss per used car sold varied from a low of $14 in Atlanta and Denver to a high of $59 in Washington. Denver's position is thus peculiar in that while the average allowance is the highest the loss is as low as the lowest; otherwise the results are as might have been expected.

The average loss per used car sold for all G. M. dealers who reported was $24 in the first half of 1926; $28 for all of 1925, and $26 for all of 1924, an apparent trend upward, but far short of the peak of $65 reported for

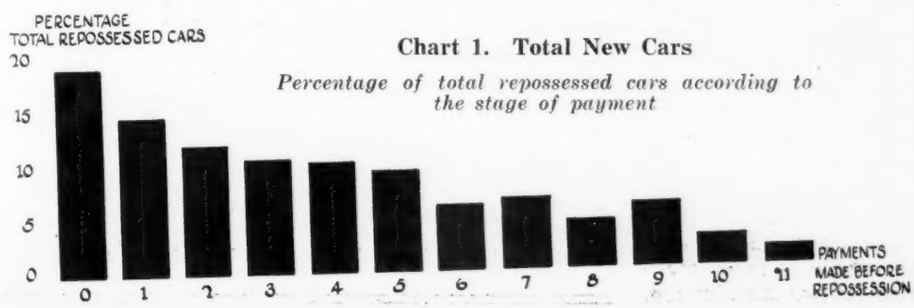


Chart 1. Total New Cars

Percentage of total repossessed cars according to the stage of payment

1921. Average total losses per dealer on used cars are $1,440 in the first half of 1926; $2,604 in 1925, and $3,569 at the peak in 1923. Prof Seligman points out, however, that the actual losses may be higher than those indicated. Many dealers do not keep accurate records and it seems that relatively few apportion any of the overhead and selling expenses to these cars.

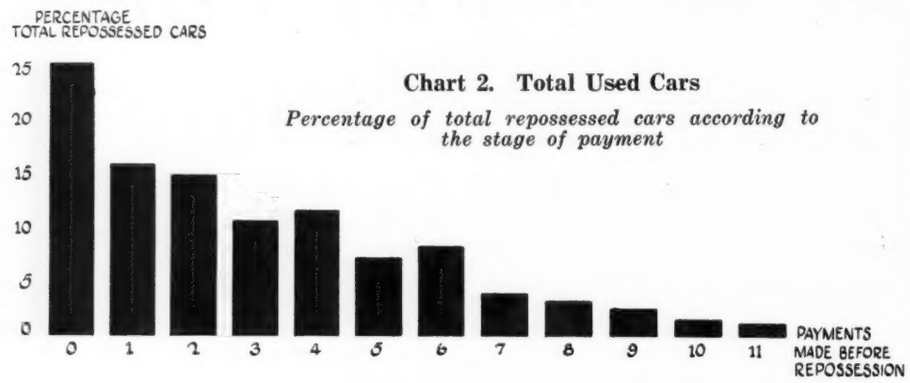


Chart 2. Total Used Cars

Percentage of total repossessed cars according to the stage of payment

The average loss per General Motors dealer reporting on repossessions is as follows:

Average Total Loss Per Dealer Reporting on Repossessions

	1926 (first half)	1925	1924	1923	1922	1921
All G. M. dealers....	$168	$294	$211	$179	$434	$325

Prof. Seligman's figures of course show that the largest proportion of dealer failures is the result of over-allowance on used cars. Yet he finds that the number of dealer failures is no larger, and the turnover is less, than in many other lines. His survey of banking opinion indicated that bankers who have had experience in the financing of dealers are of the opinion that the automobile dealer is as good a credit risk as the average business man.

Additional light is thrown on a much debated question by the following table:

Percentage of the Total Number of Cars Sold Represented by Used-Car Sales

1926	1925	1924	1923	1922	1921	1920	1919
47.2	49.7	47.7	40.6	40.8	41.3	46.1	37.0

It will be seen that from 1924 to the end of June, 1926, the average dealer has sold approximately one used car for each new car.

A significant point brought clearly to light is that the greatest proportion of repossessions come in the early months of payment, as shown by the accompanying chart covering new cars. In fact, on new cars, 18 per cent of the repossessions come in the first month—before any of the payments are made—and on used cars 24 per cent of repossessions come in this class. From the first month on there is a gradual decline in the proportion of repossessions.

These figures the author interprets as obviously demonstrating that the dealer himself is largely responsible for repossessions. The reasons why payments are discontinued toward the end of the payment period come under several headings and many of them are causes that could not be foreseen at the time of the sale. But when a buyer is unable to make more than the initial payment, or one or two instalments, it is fairly clear that he never should have been sold the car. This particularly applies to new cars; where used cars are concerned the condition of the vehicle may have been so badly misrepresented to the purchaser that he is justified in discontinuing payments.

From every point of view Prof. Seligman finds that whatever troubles have been experienced with instalment selling are not inherent in the system but are chargeable to the manner of its handling. In this connection his discussion of the effect of a large outstanding liability for instalment payments by consumers in the event of a depression is most illuminating.

Prof. Seligman seems to have discerned what was seldom, if ever, commented on before—that as wages decline much less than profits in a period of depression, losses and frozen credits are much less likely to result from consumers' liabilities than from producers' or distributors' liabilities. During the anthracite coal strike, approximately half the wage-earners of the districts affected were deprived of their normal income; yet the losses to banks and finance companies on automobile business were negligible. Presumably dealer losses were heavier than usual, but, although the figures are not given, it seems reasonable to suppose that dealers handling lines other than automobiles were at least equal sufferers.

Situation Can be Controlled

"When the time comes to pull in sail, instalment selling can cease altogether," writes Prof. Seligman. "If the general business outlook is squally the prudent dealer will stop selling on instalments or will be induced to do so by the finance company. As a consequence, the total volume of outstanding paper will diminish with every succeeding week; and, in the case of automobiles, will completely disappear within several months. In ordinary business practice, however, it is precisely in bad times that the bank is compelled to continue to extend its credit to customers of doubtful solvency, in order, if possible, to tide them over the difficulty."

He suggests, finally, that recovery from a depression may be accelerated by the practice of instalment selling, when sales could otherwise not have been made.

As to the future, Prof. Seligman notes that instalment selling is applied primarily to products more

Table 1

Showing how proportion of time sales decreases as car prices go up

G. M. Lines	1926 (first half)	1925	1924	1923	1922	1921	1920	1919
A.....	68.6	68.6	70.6	64.4	57.9	59.2	73.7	74.8
B.....	62.1	59.9	61.9	70.8	62.9	46.9	53.8	47.6
C.....	64.3	67.4	64.8	60.2	53.9	18.8	16.4	7.6
D.....	46.9	42.5	42.7	41.3	37.0	35.6	26.0	29.4
E.....	28.7	28.8	29.7	21.6	14.6	14.6	11.8	8.3
All G. M. Lines	55.9	52.0	50.7	45.8	37.1	33.7	29.2	32.6

or less recently introduced to the consumer. But from this he does not draw the inference that the stimulation given to production is only temporary. He points out:

"There is no such adamantine limit to the purchasing power of the community, and no such fixed saturation point as is often assumed * * * Purchasing power depends upon income, and if as a result of improved processes, both of production and distribution, the income of the consumer constantly rises, his purchasing power will grow in proportion, and the saturation point of his enjoyments and purchases will continually recede. If the farmer's income grows, he will be induced to use several automobiles instead of a single one; and when he has a sufficient number of automobiles, he will, if permitted by his income, gradually increase their quality. There are, in other words, no limits to the growth of demand save those which depend upon the physical and economic restrictions on production. If the possibilities of output are boundless, the possibilities of consumption are still more so."

These are encouraging words, coming as they do from one of the foremost economists of the day.

Kissel Introduces New Eight-Cylinder Model With Sedan at $1,895

AS a companion to its new light six, announced a short time ago, the Kissel Motor Car Co., Hartford, Wis., is introducing a light eight, known as the 8-80. For the present the new car will be produced only in a four-door brougham sedan model at $1,895.

An overall height of 66 in. is made possible by a frame kickup of 5½ in., at the rear and 1½ in. in front. The frame is narrowed in front to reduce the turning radius. The 7-in. channel sections are slightly arched, so that when the car is loaded they straighten out to allow perfect support for the body.

The engine, with the exception of a few details, is the same as that used in the previous Model 8-65, having cylinder dimensions of 2⅞ by 4¾ in. The piston displacement is 248 cu. in., and the compression ratio 5 to 1. The maximum torque of 158 lb.-ft. is reached at 1000 r.p.m.

A 1¼ in. Schebler carburetor, fed by vacuum tank through a Gas-Co-Lator, is standard equipment. Swan-type manifolding is employed, and an air cleaner is mounted on the carburetor horn. The 15-gal. fuel tank is located at the rear and mounted on a riveted steel angle support.

A two-unit Delco-Remy ignition, lighting and starting system is employed in connection with a Willard storage battery located under the right front seat. A semi-automatic ignition system is used, with 15 deg. of manual and 20 deg. automatic advance.

The 10-in. Borg & Beck single plate dry clutch and the Warner transmission are mounted integrally with the engine. Pedals are adjustable and the clutch is lubricated through Alemite fittings.

A tubular, welded driveshaft connects the transmission and rear axle by means of a Mechanic's all-metal universal joint.

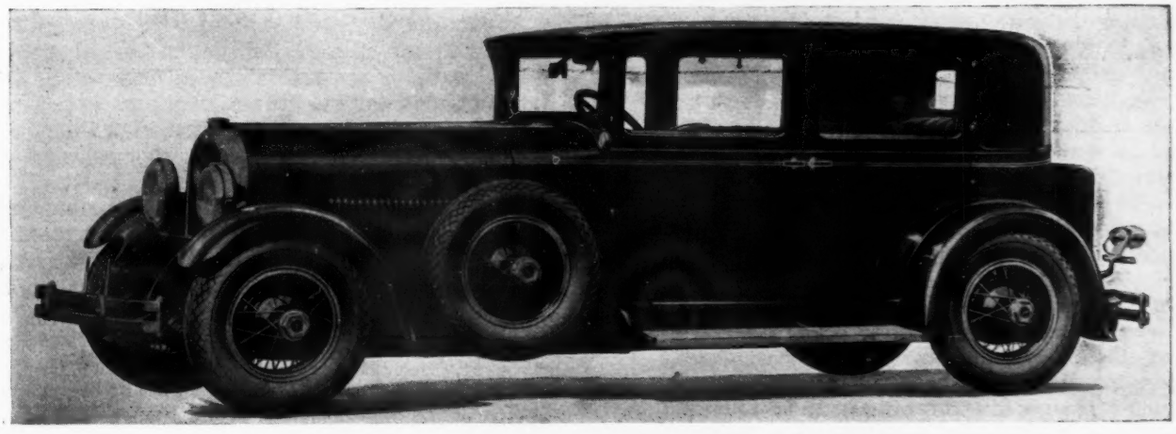
Both the front and the rear axle are of Columbia make, the latter being of semi-floating, spiral-bevel gear type. Standard gear ratios are 4.63 to 1 and 5.1 to 1. Hotchkiss final drive is employed.

Hydraulic Brakes

A Ross cam and lever type steering gear is used, with 18 in. steering wheel with walnut spider and rim. Lockheed four-wheel hydraulic brakes of the the contracting type are used. Brake drums are 14 in. in diameter with a 2 in. face. The emergency brake, also of the contracting type, is mounted back of the transmission.

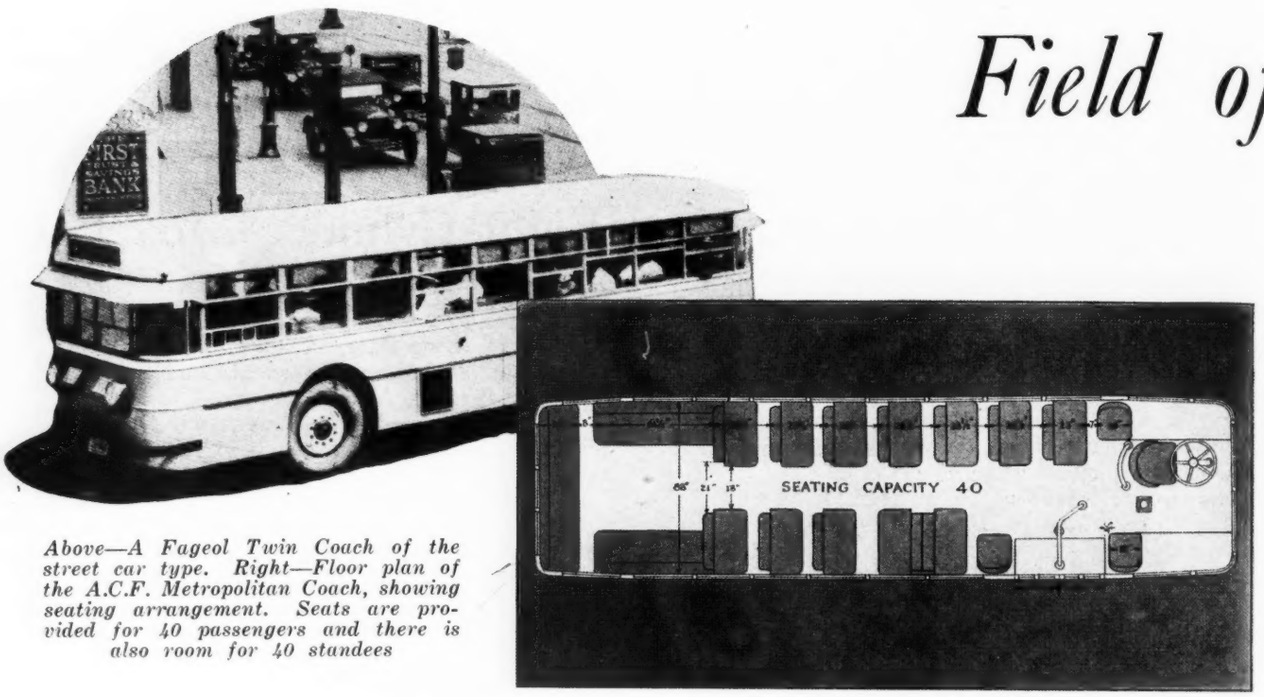
All springs are semi-elliptic and made of alloy steel. The underslung rear springs are 57 by 2 in., the front springs 38 by 2 in. Rubber cushion shock-insulating shackles connect the springs with the frame. The engine also is mounted on rubber shock insulators.

Bodies are constructed of seasoned ash covered by 20-gage body steel. Fenders are of 18-gage steel. Wheels are of wood. The body top is constructed with a curved visor cut off at an acute angle. A new type of tilted windshield with a one-piece glass is used. The windshield frame is a single casting and is highly finished. The chassis is lubricated by the Alemite system. Tires are 30 x 6 in. and the wheelbase is 125 in.



Kissel 8-80 four-door brougham sedan which lists at $1,895

Will New Street Car *Field of*



Above—A Fageol Twin Coach of the street car type. Right—Floor plan of the A.C.F. Metropolitan Coach, showing seating arrangement. Seats are provided for 40 passengers and there is also room for 40 standees

THREE manufacturers—Twin Coach, A.C.F. and Versare—recently have introduced new bus models in which radical departures are made from conventional automotive construction and which follow electric street car practice not only in appearance but also in some of their design features.

Without any material increase in overall dimensions, these new types provide a considerable increase in carrying capacity over anything that has been obtained in a single-deck coach of conventional design. For this reason they may be important factors in extending the economic field of the bus, although, like every other new product, they must prove their merits in actual service.

What follows, therefore, is written with due regard for the need of more operating experience with the new types. Certain claims are made for them by their manufacturers and certain results anticipated. These are set forth without any attempt to plead a case or hand down a judgment.

The smaller carrying capacity of the conventional single-deck bus in comparison with the electric street car has frequently been regarded as one of the serious limitations on its usefulness in the field of mass transportation. The double-decker has not entirely answered this objection, as many operators feel that safety requires two-man operation of this type, and the added platform cost more than offsets the economies of greater carrying capacity. It follows that any increase in the carrying capacity of the one-man-operated, single-deck bus, other factors being equal, immediately widens the field of the motor vehicle in mass transportation.

What is probably the general trend of thought on this point among electric railway men was well expressed by R. N. Graham, manager of railways, Pennsylvania & Ohio Railways, Youngstown, Ohio, in a paper presented last spring before the Metropolitan Section of the Society of Automotive Engineers. Mr. Graham said:

"One basic, serious and important distinction between the motor coach and street car, however, that sharply limits the use of the former at the present time as an economic substitute for the street car in mass transportation, is the difference in size. Two major conditions differentiate mass transportation in America absolutely from that in any other country. First, public transportation in every city in the United States is conducted on a flat fare, that is, the fare per ride is the same regardless of distance. This has been the practice for so many years that, as a measure of practical expediency, it may be said that it is impossible to change or uproot it.

Intermediate Traffic Light

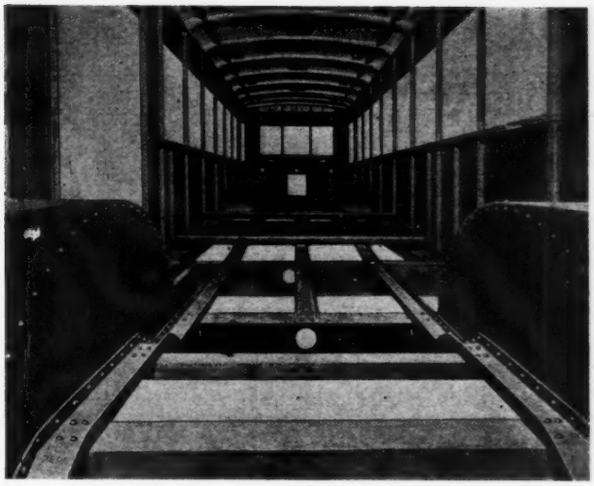
"Second, the maximum capacity of the vehicle is, with very few exceptions, used only once on a single trip. In the United States the growth of the cities has been outward in every practicable direction from the nucleus first established. As a result, whether one goes to Cleveland, Chicago, Kansas City, Omaha, Dallas, Houston or Los Angeles, he will find that intermediate traffic is very light. In the morning the workers ride from their homes to the stores and offices, and in the evening they ride in the reverse direction. During the day the passengers ride from the home to the theatres, shops and stores, and then return home. Thus the maximum capacity of the vehicle on any trip is in use but once."

Mr. Graham then pointed out that the average number of passengers per trip is about 40 per cent of the seating capacity of the vehicle, considering the whole operating day. For the whole United States, the aver-

Models *Extend Economic the* Bus?

Question is whether increased revenue made possible by greater carrying capacity can be obtained without an offsetting increase in operating costs. Three makes now on market.

By Donald Blanchard



One of the most important characteristics of the street car type bus is the body, which also combines the function of the chassis frame. The above view shows the construction of the A.C.F.

age fare, including transfers, free passengers and school children, is 7 cents. The income per trip for a 25-passenger coach therefore averages 25 x .40 x 7 = 70 cents. The operating cost totals about 30 cents per mile for the conventional bus, so that the operation is profitable if the route is two miles long and unprofitable if it is three miles long.

Using the same assumptions, the income per trip for a vehicle seating 40 passengers would be 40 x .40 x .07 = $1.12. If it could be assumed that the 40-passenger bus could be operated for the same per mile cost, namely, 30 cents, as the 25-passenger size, then under the conditions assumed the limit of route mileage for profitable operating is extended to over 3½ miles. The assumption of equal operating costs per mile for the 25 and 40-passenger sizes, of course, is a questionable one and is made here only to illustrate the influence of passenger capacity on the length of route over which it is profitable to operate a bus at a fixed fare. The electric street car has a similar limitation but, because of its relatively large carrying capacity, this becomes effective at a greater mileage. Regardless of the assumptions made as to fares, operating costs and load factors, it is obvious that the fixed fare places a limit on the bus.

The carrying capacity of neither the bus nor the street car is of great moment during the off-peak periods, as the traffic then is less than the number of seats. But it becomes of great importance in the rush hours when all seats are occupied and a standing load is carried in addition. Then the capacity of the vehicle determines how many trips must be run to take care of the traffic.

Because of the smaller carrying capacity of the bus, more trips must be made, which means increased operating costs and a greater investment in equipment. During the off-peak periods, the requirements of giving service determine the schedule frequency. This point was illustrated by Mr. Graham, who cited Youngstown bus and street car lines, operating under similar conditions, in explanation. Because of the greater operating speed of the bus, three buses are required to provide the base schedule on one route, while four street cars are needed on the other route. In the rush hours, however, only one extra street car is required to handle the traffic, while three extra buses are needed. The traffic carried by the two routes is approximately equal and the routes are of about equal length.

Only Experience Will Tell

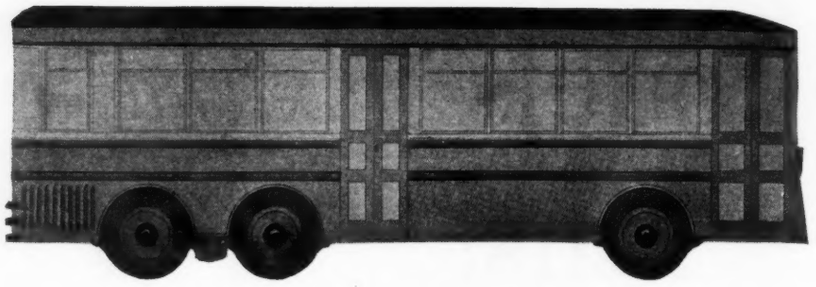
If we accept this analysis of the situation, it is clear that increased carrying capacity such as is provided by the new street car types means a wider field for the bus provided this greater capacity is obtained without an offsetting increase in operating costs. Only operating experience will tell how the operating costs of the conventional and new street car types will compare, but it is pertinent to discuss at this time some of the possibilities.

The following statement made by H. D. Church, director of engineering of the White Motor Co., probably is typical of the attitude of automotive engineers generally:

"From the standpoint of traffic congestion, the present-day motor coach probably represents the top limit on overall length. It is possible that future developments may result in a complete relocation of the various chassis units in an endeavor to obtain more seating capacity within the present overall length. The conventional location of the chassis units as now used has been developed in motor cars over a long period of time, and is the most satisfactory one we know of today. On the other hand, it is possible that some satisfactory new arrangement may be worked out which will utilize practically the entire length of the chassis for passen-

gers. Any departure of this sort, however, will have to prove its worth in actual service as there are many questions of design and accessibility to be answered."

Aside from the unconventional location of some of the units, the most important characteristic of these new "street-car" buses is the body, which also performs the function of the chassis frame. The powerplant is secured to the body structure directly, while the axles are secured to it through the springs. This construction is to a certain extent typical of electric street car practice. The street car, however, operates over reasonably smooth rails, whereas the bus uses the highways, which sometimes are quite rough.



Versare six-wheel bus of the street car type

There are several possible advantages in combining the frame with the body, for that, after all, is what is done in the new type. There is no doubt that the same rigidity in the vertical plane can be obtained with less weight, due to the more intimate tying together of the sills and the body paneling. Besides, if the body and frame are made a unit it is possible to bring the floor lower to the ground and thereby increase the stability of the coach.

Has Been Used Before

This unit construction idea has been applied in automobile manufacture a number of times, the Lancia Lambda being a prominent example. That it has not proved particularly popular in that field is due probably to a number of reasons. The same type of automobile chassis is usually fitted with a number of body styles, and if chassis frame and body were made a unit the present method of chassis assembly would be impossible. There would have to be as many assembly lines as there are body styles.

Besides, in an automobile some of the mechanical components are rendered less accessible. In the case of a major overhaul, automobile mechanics always remove the body to assure free access to all parts and prevent marring and soiling of the body. The manufacturing objection to the unit construction does not apply to the coach, which at the present time is not assembled on a conveyor, and as regards methods of overhaul of mechanical units, there is no doubt that an entirely different technique will be worked out for the street car type of bus, based upon the practice now followed in street car work. In fact this new technique already is in evidence as Versare has developed a special truck to facilitate removal of the powerplant and a jack is now on the market designed to remove the Twin Coach powerplant.

The carrying capacity of the coach is determined largely by the floor space of the body. In the Twin Coach and the A.C.F., the overall body dimensions are about 30 x 8 ft., giving an area of 240 sq. ft. Seats are provided for 40 in each case, while the rated standing load of the former is 35 and of the latter 40. The maximum body floor area of the conventional type, assuming the same overall length, is in the neighborhood of 200 sq. ft. The seating capacity in this case would not be over 33. With both types, the number of standees depends to a considerable extent on how much crowding is permitted. As no rated standing load ordinarily is given for the conventional single-decker, no fair comparison on this basis is possible. However, the differences in areas would indicate that the carrying capacity of the "street car" type is more than 20 per cent greater than that of the conventional design, as the driver must be provided for in each case.

From manufacturers' specifications it appears that a 33-passenger conventional design would weigh about 12,500 lb. as against between 14,500 and 16,000 for the new types. Assuming the same average operating speeds, the consumptions of gas and oil and the tire expense should vary approximately as the weight, so that, figuring on an average increase in weight of 22 per cent, these items of cost for the street car type show an increase substantially equal to the increase in carrying capacity. However, as these items represent only from 20 to 25 per cent of the total expense, the increase in the total cost would be only about 5 per cent, for the weight relations used in this calculation.

Only experience can tell accurately how the maintenance costs of the two types will compare. Engines, clutches, transmissions, axles, etc., follow conventional practice and should require the same amount of routine maintenance, and overhauls at the same intervals, for both designs. As far as these units are concerned, the relative accessibility of the two constructions is the determining factor. Driveshafts, axles and steering gears would appear to be equally accessible in both types. The comparison is not so easy in the case of powerplants, but with pits and proper handling equipment, it is held, the street car type should offer no greater difficulties in replacing units, while for routine maintenance the engine compartment may be reached from both inside and outside of the body. On this assumption it would appear that the cost of maintaining the engine, power transmission line and running gear should show no material variation for the two types, except as these costs are influenced by the respective weights.

Body Maintenance

Body maintenance is largely a matter of conjecture. Certain advantages from the standpoint of stress distribution are claimed for the street car type. Electric street car practice would indicate long life and low maintenance cost for this type of structure, but the difference between smooth rails and rough streets introduces an element of uncertainty here.

Depreciation also is a matter of conjecture. The powerplant, driving elements and axles should have the same life as in the conventional design, assuming that these parts are properly proportioned to take care of the greater average torques called for by the greater weights. It would seem, therefore, that the question of body life is the one concerning which the greatest uncertainty exists.

Because of the greater carrying capacity of the street car type, fewer buses would be needed, ordinarily, to

Another view of the Versare bus (left), and the A.C.F. Metropolitan Coach

provide the same service as a certain number of the conventional type. This would tend to offset the higher first cost of the street car type.

The "performance" of the two types is determined by piston displacements and rear axle reductions. The Twin Coach weighs 28 lb. and the A.C.F. 34 lb. per cu. in. of piston displacement, as compared with from 26 to 30 lb. per cu. in. for the conventional single-decker. Inasmuch as great speed is not important in mass transportation, the required acceleration can be obtained by increasing either the piston displacement or the axle reduction—in both cases at the expense of increased fuel consumption.

In discussing the prospects of the new type of bus the factor of appearance cannot be entirely neglected. It is possible that the conventional modern bus will make a stronger appeal to the average potential "fare" than the new type. The former bears a closer resemblance to the private passenger car, which most people undoubtedly regard as the highest type of transportation equipment. It is hardly to be expected, however, that any bias against the new type on this ground will carry much weight, and, in any case, it is destined to be only temporary if the new type proves to be an equally comfortable conveyance and to possess economic advantages. Incidentally, the appearance of the new type probably will meet with favor among electric railway men who constitute an important part of the market for this design.

All three of the street car types brought out have two doors, which speeds up loading and unloading and cuts down the time loss in these operations. The time thus gained may be used to increase average operating speeds, or, if it is desired to sacrifice acceleration for reasons of economy, to offset any slight deficiency from this point of view. Ordinarily the single-decker of conventional type has only one door.

Reduced Storage Costs

The smaller number of vehicles required to provide a given service results in reduced storage costs, as less garage space is necessary, and also in a saving on insurance and taxes. Some of what might be termed overhead costs—but which are necessary expenses of a transportation enterprise—bear a relation to the number of vehicles operated, so a saving might be anticipated here too. On the other hand, assuming equal life, the depreciation cost of the more expensive vehicle will be greater.

Summing up the situation we have the following: The greater carrying capacity of the street car type broadens the field of the bus in mass transportation at a fixed fare, because it makes it possible to earn a larger average revenue per vehicle per trip. The question then is whether this increased revenue can be obtained without an offsetting increase in operating costs.

Because of the greater weight, gas, oil and tire expense may be expected to show an increase. Driver's wages will be the same. Storage and possibly investment charges, insurance, taxes and certain items of the overhead expense may be less because of the smaller number of vehicles required to give a definite service. Depreciation and maintenance are the chief elements of uncertainty. Operating experience alone can determine these two factors and establish whether the increase in certain expenses will be offset by the decrease in others.

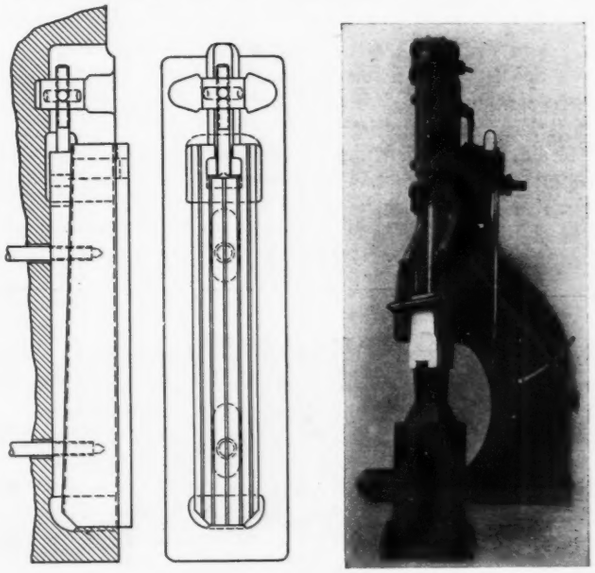
These uncertainties will be cleared up in due course, as street car type buses are now in actual service in Chicago and other cities. The results obtained from these installations may have an important effect on the future bus market.

Guided Ram Hammers

THE new power hammer herewith illustrated, which is manufactured by the Chambersburg Engineering Co., Chambersburg, Pa., has the advantage that it provides an unusual amount of working space for a single frame guided ram hammer, making it possible to forge large disks and rings, to upset high stems, form arch bars, etc. Long punching with drifts also is facilitated by this construction. The increased clearance between the die and the under side of the frame increases the capacity of the hammer.

In the design of this hammer, economy of operating fluid, either steam or air, has been aimed at. Deep stuffing boxes are used on the intake steam connection, and the steam joint between this stuffing box and the cylinder has been eliminated. The cylinder is self-draining, and a patented safety cover is used which is claimed to reduce the steam consumption. The throttle valve is of the self-seating rotary type, while the operating valve is ground into a removable cage.

A feature of the Chambersburg hammers is a safety cylinder cover, by which a cushion of live steam or air is provided at the top of the cylinder.



Chambersburg high frame guided ram hammer and the ram guides

New High-Speed, Heavy-Duty *Mack* Truck Announced

Model which is rated at 3½ to 5 tons has four-wheel brakes, high-compression four-cylinder engine, four-speed transmission and rubber spring mountings.

By James W. Cottrell

A NEW truck model designed for high-speed, heavy-duty service is being offered by Mack Trucks, Inc., New York. The new unit, which is designated the Model AK and is rated at 3½-5 tons, has four-wheel brakes, a high compression four-cylinder engine, a four-speed transmission and rubber mountings for the spring ends and other parts. It is supplied with either chain or double reduction drive.

In designing the AK truck Mack engineers sought to compensate for the weight restrictions imposed by state legislation by producing a truck that should be capable of a greater daily mileage. This greater mileage is the result of improved acceleration as well as of the ability to hold the road at comparatively high speed, and to stop quickly.

The design incorporates some features found in the AC and AB trucks. The hood, radiator and front end have the characteristic appearance of the corresponding parts of the AC, the dual reduction gear drive and the rubber mounting of the transmission, springs, etc., have been taken over from the AB, while the chain drive follows AC design.

The engine, which is rated at 70 hp. at 1400 r.p.m., has its cylinders cast in a block of semi-steel, heat-treated; they have a bore of 4⅝ in. and a stroke of 6 in., giving a piston displacement of 403.2 cu. in. Two detachable cylinder head castings of aluminum are used, and the combustion chamber is of the turbulence type.

Pistons, which are of aluminum, are 5½ in. long and are fitted with four rings. Connecting rods are tubular, machined all over, with a center-to-center length of 15 in. The piston pin is 1 7/16 in. in diameter and 4½ in. long.

The crankshaft, which is case-hardened, is supported by three main bearings each 3 in. in diameter, the lengths (front to rear) being 3 5/32, 3½ and 4 1/32 in. respectively. Crankpins are 2⅜ in. in diameter and 3½ in. long.

Three bearings support the camshaft, which actuates the valves through roller tappets. The inlet valves are of chrome-nickel steel, while the exhaust valve material is silicon-chromium steel. Valves have a clear diameter of 1⅞ in. and the lift is 7/16 in.

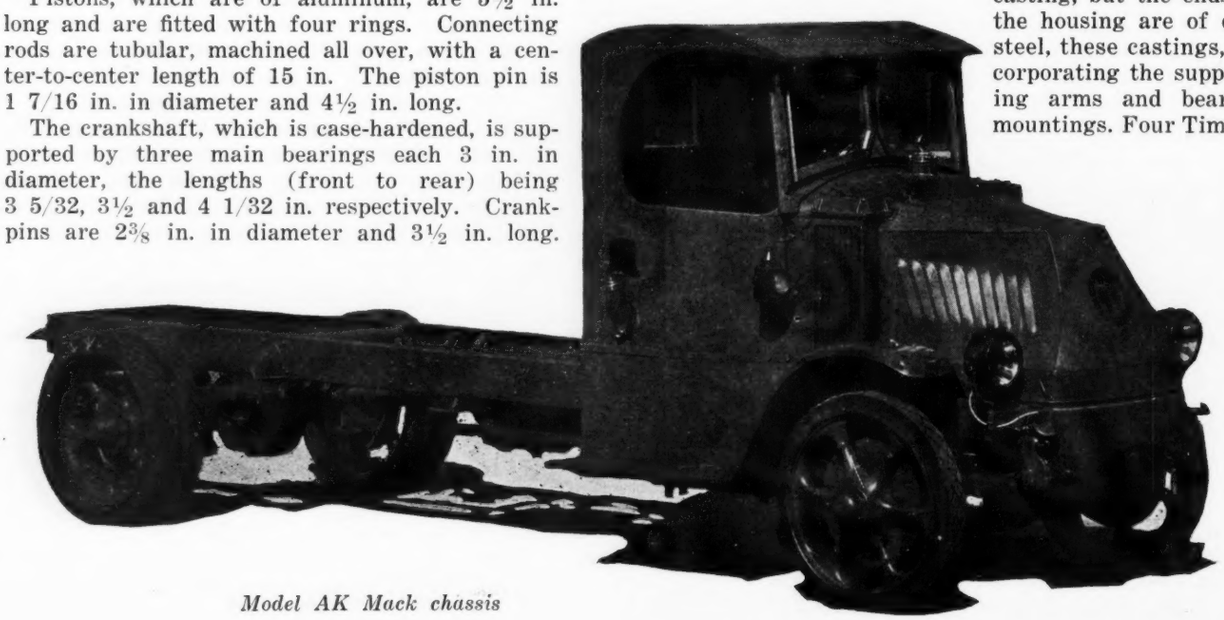
Lubrication is by the combination force-feed and splash system, as used in other Mack models, but a Purolator oil filter has been included in the circuit. The cooling system is similar in design to that on the AC models, a fan built into the flywheel drawing air through radiator sections mounted in the rear of the engine. Water is circulated by a centrifugal pump with a balanced type bronze rotor, the discharge being directed around the exhaust valves.

Centrifugal Oil Cleaner

Ignition is furnished by a Splitdorf 137 magneto driven by a cross shaft at the front of the engine. The carburetor, a Stromberg OT-3, is placed low on the right side and is supplied with fuel by gravity from a 35-gal. tank under the driver's seat. A centrifugal type air cleaner is employed.

A single-plate clutch of Mack design is used, and the power is carried through an intermediate shaft to the transmission. This shaft connects through one Spicer universal joint and a Mack rubber torque insulator similar to that employed in the bus chassis.

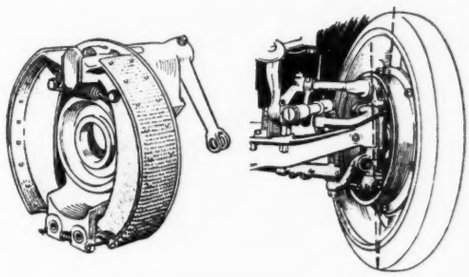
The transmission housing is a one-piece aluminum casting, but the ends of the housing are of cast steel, these castings, incorporating the supporting arms and bearing mountings. Four Timken



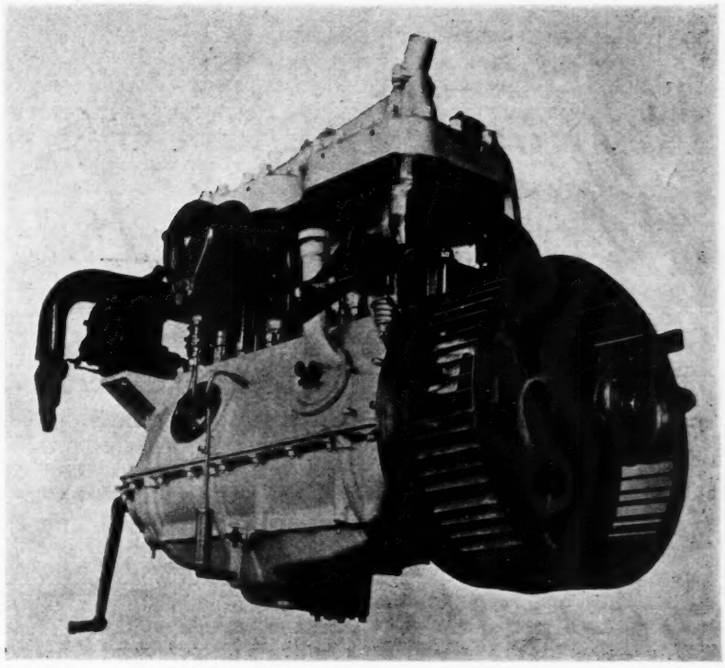
Model AK Mack chassis

roller bearings, three ball bearings and one disk-type bearing are used in this unit, which is rendered accessible by a side cover without removing the body floor. Four speeds forward and reverse are provided, and at slight extra cost a specially high speed reverse may be had, which is convenient in some lines of work, such as road buliding. Four Mack rubber shock insulators are employed for the transmission mounting.

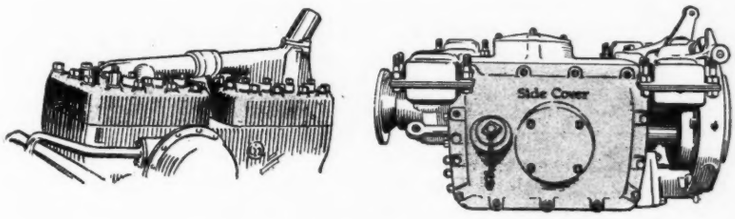
From the rear of the transmission forward the dual reduction and the chain drive models are identical. The chain drive is similar to that employed on the AC, pressed steel radius rods being secured to brackets bolted to the frame side members. The rear springs used with this type of drive are 52 in. long and 4 in. wide, with 13 leaves, two-stage semi-elliptic auxiliary springs are also provided.



Two views of the wheel brakes, which are actuated by a vacuum booster



Power unit for Mack AK model



Aluminum detachable twin cylinder heads and gearbox accessible through a side cover without removing floorboards

The shaft drive model embodies the forged, banjo-type rear axle with integral spring seats and dual gear reduction like the AB shaft-driven model. The propeller shaft, which is tubular, is practically straight and is equipped with two Spicer universal joints. Rear springs are 56 by 4 in., have 14 leaves, and are mounted in Mack rubber shock insulators. Auxiliary springs are used in this case also. The main springs are flat and have a reverse camber when loaded. Front springs of both models are 48 by 3½ in., with 11 leaves, and they too are mounted in rubber.

Four-wheel brakes are employed on both the chain and dual gear reduction models. Wheel brakes are internal, with two rigid shoes mechanically operated, AB-K booster being regularly supplied but not included in the list price. Front brakes are 18 in. in diameter and 3 in. wide. Rear brakes of the chain drive unit are 18 in. in diameter by 4 in. wide and the dual reduction gear model rear brakes are also 18 in. in diameter and 4 in. wide. Hand brakes of the chain model contact on 14 by 3½ in. jackshaft drums and on the gear drive on a 10 by 4 in. drum at the rear of the transmission.

Frame side rails are 8½ in. deep with 2¾ in. flanges and of ¼ in. stock. There are four cross-members. Standard wheelbases are 162, 174 and 186 in., and two special lengths, 204 and 228 in., are offered.

The front axle is of the reverse Elliot type and center-point steering is obtained by inclining the knuckle pin laterally and using a reverse dish in the front wheels. A smaller turning radius and easier steering are advantages claimed for this construction.

Tires are 36 by 5 in. solid on the front and either 35 by 10 single or 35 by 5 in. dual on the rear. Pneumatic tires are supplied at extra cost, the size being 36 by 8 in. all round, with duals on the rear wheels.

The all-steel cab is roomier than that on the AC model. It is mounted on rubber shock insulators and the driver's seat is also supported on rubber. The filler for the gasoline tank with integral gage projects from the right side of the cab.

WE have received a copy of a publication containing illustrations and specifications of German airplanes and airplane engines. The title of the pamphlet is Luftfahrzeuge and Luftfahrzeugmotoren, and it is published by C. W. Erich Meyer, Dresden. Airplanes and seaplanes by Albatros, Arado, Caspar, Dornier, Focke-Wulf, Heinkel, Junkers, Klemm-Daimler, Messerschmidt, Raab-Katzenstein and Rohrbach are covered, and engines by BMW, Junkers, Mercedes-Benz and Siemens.

A PAPER on Smooth Finish Machining of Low Carbon Plain and Alloy Steels, presented before the spring sectional meeting of the American Society for Steel Treating, at Hartford, Conn., by J. S. Vanick and T. H. Wickenden, has been reprinted for the International Nickel Co., 67 Wall St., New York. It contains a practical explanation of shop practice for obtaining a smooth finish on the materials mentioned by avoiding the critical range in volume removal rates, as well as tables indicating the most satisfactory cutting speeds for the purpose mentioned.

Italian Engineers Hold Internal Combustion *Engine* Congress

Motor fuels, detonation, control of combustion in cylinders, flexibility of engine operation and vibration are discussed. Tribute paid to Bernardi.

A CONGRESS dealing with the chemical, thermodynamic and mechanical problems of internal combustion engine power was held this year at Padua, Italy. One of its objects was to do homage to Enrico Bernardi, a pioneer of the motor vehicle movement in Italy, who built a motor bicycle and a motor tricycle as early as 1893 and who is credited with having been one of the first to solve the problem of steering with a divided front axle.

The papers presented at the congress dealt with all of the problems relating to the internal combustion engine and its applications.

Threatening Fuel Shortage

Professor Carlo Padovani of the College of Industrial Chemistry of Bologna dealt with the threatening engine fuel shortage. It is the work of the chemists, he said, to find a suitable substitute for the natural hydrocarbons in order to save numerous nations from threatening economic and political dependence and to obviate a dangerous crisis for the whole civilized world. The solution of the present situation seems to lie either in the discovery of new petroleum deposits or in new conquests of synthetic chemistry. Prof. Padovani expressed the opinion that it is highly desirable that all investigations concerning this problem should be assigned to a central specialized body, well equipped and well endowed.

Dr. Umberto Re, also of the College of Industrial Chemistry of Bologna, dealt with the subject of sulphur in motor fuels. He listed the various sulphur compounds found in petroleum distillates and distillates of asphalt and shales, and pointed out the troubles which arise from the presence of these impurities. He then described a new apparatus for the rapid determination of sulphur, which he claimed to be much handier in use and much simpler than the gravimetric process in common use. Finally he briefly reviewed the methods of desulphuration in use which appear to be the most efficient.

Alcohol as motor fuel was dealt with in a communication by Prof. M. Capetti of the Royal Engineering School of Padua. The viticultural interests of Italy are much interested in the subject and a national competition for vehicles operated on alcohol and on alcohol mixtures was held under their auspices in 1926. The author said it had long been known that alcohol would withstand a much higher compression than gasoline, but it was less well known that it will also withstand much higher dilution (leaning of the mixture). In all of the tests the differences in the specific consumptions were greater on the road than on the test bench, which was ascribed to the fact that in road service the alcohol mixtures could be diluted more. In support of this hypothesis the author cited the recent results of Callendar in England.

Professor E. Pistolesi, of the Royal College of Engineers of Pisa, discussed the phenomenon of detonation and drew attention in this connection to the results of English experimenters, the nuclear theory of Callendar and that of the pyrophoric effect of Sims, as regards the explanation of the effect of antidetonants. He developed an elementary theory of the problem of detonation, based on the hypothesis of a practically infinite speed of combustion and uniform pressure throughout the combustion chamber. He assumes, moreover, that there is practically no heat exchange between the strata or layers of the mixture. He is thus enabled to determine what is the fraction of the charge whose combustion creates such a pressure that the polytropic compression of the rest of the charge may carry it up to the temperature of ignition. According to the author, it is at this moment that detonation is produced. In this way the influence of the initial pressure and temperature may be explained. On the basis of this theory he furnishes an explanation of the effects of turbulence. Finally, he explains why self-ignition of the whole charge by a compression carried too far does not produce the phenomenon of detonation.

Control of Combustion

Dr. Umberto Re also dealt with the control of combustion in engine cylinders. As regards its thermochemical efficiency, combustion in the engine cylinder is usually only 50 per cent complete. It is therefore necessary to conduct experiments to determine the exact nature of the process of combustion within the cylinder. The author discussed the influence of pressure and temperature and described the use of a pyrometer as a continuous check on the temperature of combustion. He also described a special apparatus for the instantaneous taking of samples of gas from the combustion chambers. Finally he discussed the practical possibility of a continuous check on combustion on the vehicle, by means of an apparatus electrically connected to indicators in direct view of the driver.

The properties of gases at the temperatures and pressures obtaining in engine cylinders also form an important element in the thermodynamic problems of the explosion engine, and this subject was discussed

in two communications of V. Gallina. The first of these dealt with the specific heat of gases at high temperatures and high pressures. The author made reference to the Mollier-Stodola diagram (1924) for superheated steam, obtained by extrapolating the Callendar equation, and showed that direct experiment is necessary in order to accurately determine the values of the specific heats C_p and C_v.

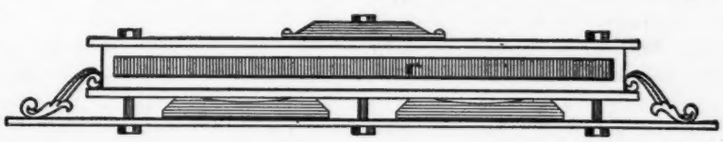
Starting with different expressions defining the state of molecular aggregation of superheated vapors and of perfect gases, he showed how investigators have been led to attribute quite different values to these specific heats, and why it is difficult to prove that one of the known equations is more nearly correct than the other. He concluded by making the suggestion that high temperature laboratories should be established in Italy and other countries, similar to that for very low temperatures established by Kammerlingh Onnes at Leyden, Holland.

Transformation of Gaseous Mixture

The same author also presented a discussion on the transformation of the gaseous mixture during the working stroke and of the numerical value of γ in the equation of polytropic expansion representing that stroke. After recalling that the transformations of the working fluid in a piston-type engine follow an adiabatic law and may be represented by a polytropic, at least from a certain point on, the author gave the values of the exponent γ in this equation for the more common working fluids. He gave certain practical examples of internal combustion engines, where the indicator diagrams gave another value for this exponent than the value of 1.41 accepted for diatomic gases. This, according to the author, may be explained by the fact that the expansion is not truly adiabatic, because the system during the expansion stroke receives or loses a certain amount of heat, because the exponent corresponding to the gaseous mixture may not be the same as for diatomic gases, or finally, because the ratio C_p C_v may have a different value for the gases actually used.

Ezio Moriondo, professor of machine design at the Naval School of Genoa, presented a new solution of the problem of flexibility of engine operation. He showed that the best results may be obtained by means of a system of regulation acting simultaneously, according to fixed laws, on the valve action, the fuel supply and the ignition timing. The author described a system recently devised by an Italian engineer which is said to completely solve this problem.

Mr. Fessia, of the engineering staff of the Fiat Works, presented three different papers on problems of engine design. The first dealt with the determination of the mean loads on the main bearings of vertical engines. It contained a number of equations developed for this case and which take account of the elasticity of the crankshaft. According to the author, these equations are more convenient than the usual graphical method, because they are less laborious and because, in contrast to the latter, they permit an easy following up of changes which are inevitably made in the course of a design. It is essential that the designer should have a clear conception of these loads, especially in the case of modern engines of high specific outputs, the materials of which are subjected to high stresses.



The second paper dealt with an investigation of a special form of vibration, referred to as pseudo-harmonic vibrations, which are produced by elastic forces the magnitude of which is not proportional to the displacement of the mass. Two special cases discussed were a single mass pseudo-elastically supported, and two masses with a pseudo-elastic connection between them.

The third paper dealt with the calculation of connecting rod caps, for which the Fiat firm has developed special formulae which in this particular case take account of the charge distribution and the maximum resistance of the system, the cap being regarded as a slightly bent column.

Carlo Trevisan briefly described a double-rotating aircraft engine invented by his brother, Bruno Trevisan. This engine, which, in contrast to all double-rotating engines previously devised, is water-cooled, is designed to operate two concentric propellers rotating in opposite directions, so as to eliminate the torque reaction and also the gyroscopic effect of the propeller. It is obvious that the application of water cooling to an engine of this type called for very special arrangements. The combustible mixture is admitted through the central shaft, which is bored out for this purpose. Operation of the cam gear and of the ignition mechanism also involves new features.

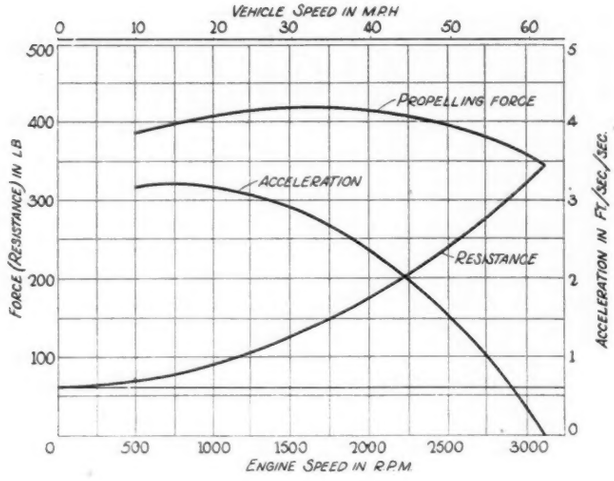
Professor Scheubel, of the Aerodynamic Institute of the Aix-la-Chapelle Technical College, gave an account of recent researches on the atomization of liquid fuels. Photographs were taken at short intervals, by illuminating the experimental apparatus by periodic electric sparks, especially the point where the liquid enters the air stream. Up to the present two types of venturi and various forms of spraying nozzles have been thus investigated. Hydrodynamic considerations, based on the theory of capillary waves, permitting of establishing a law of similitude applicable to the phenomenon.

Inertia in Intake Systems

Professor Capetti also presented an interesting discussion on inertia phenomena in the intake systems of internal combustion engines, a subject the importance of which is quite well known to all engineers. All designers take account of the inertia of the gaseous column in the intake pipe, by closing the inlet valve after the dead center point. They also know that the length of the inlet pipe has an influence on the maximum power which it is possible to obtain from the engine, both by its effect on the carburetion and by its effect on the volumetric efficiency.

The author has conceived a method of analyzing these phenomena theoretically. Experiments already made had led him to various interesting conclusions as to the existence of a maximum volumetric efficiency, which maximum corresponds to a certain proportion between the length of the inlet pipe and the length of strokes. This maximum increases slightly with the piston speed, and the corresponding proportion of lengths is the greater if the piston speed itself is small. Experiments were conducted later on the same subject for the U. S. Advisory Committee for Aeronautics. The author compared his theoretical results with those obtained experimentally by the Advisory Committee, and found complete agreement between them.

Fig. 1



Methods of

"Pickup" varies from moment to moment and in order to make a definite statement regarding its value some other variable must be referred to.

THE subject of acceleration has been quite prominent in sales talk for some time past. It is safe to say that the fundamental relations affecting it are not as well understood as those affecting maximum speed, for instance, and it may therefore be profitable to discuss these relations.

As a car is being brought up to speed from a standstill the acceleration varies from moment to moment, and in order to make some definite statement regarding its value, it is necessary to refer to some other variable. It varies with the speed which the car has acquired, to the time which has elapsed since it started from a standstill or from any given speed, and to the distance which has been covered since the start. Curves plotted with these different factors as abscissae and the acceleration as ordinates are, naturally, of entirely different appearance.

It may be assumed that the torque curve of the engine is known. This torque curve, representing full-throttle, variable-speed operation of the engine, corresponds to the operating conditions when the car is being accelerated on one particular gear. We will assume the acceleration to take place entirely on high gear, which is the condition under which acceleration tests are usually made. Of course, the car cannot be accelerated from a standstill on high gear, but this difficulty is gotten around by starting from a definite low speed, either 5 m.p.h. or 10 m.p.h.

Not all of the engine torque will be usefully transmitted to the rear wheels, a certain fraction being lost in friction. As the engine operates at nearly constant torque throughout the speed range, the assumption of a constant efficiency of transmission is justified, and we will set this down at 85 per cent. Denoting the rear axle ratio by r and the rear wheel diameter by D (inches), the torque on the rear axle will be $0.85\ T\ r$ and the propelling force on the rear wheels.

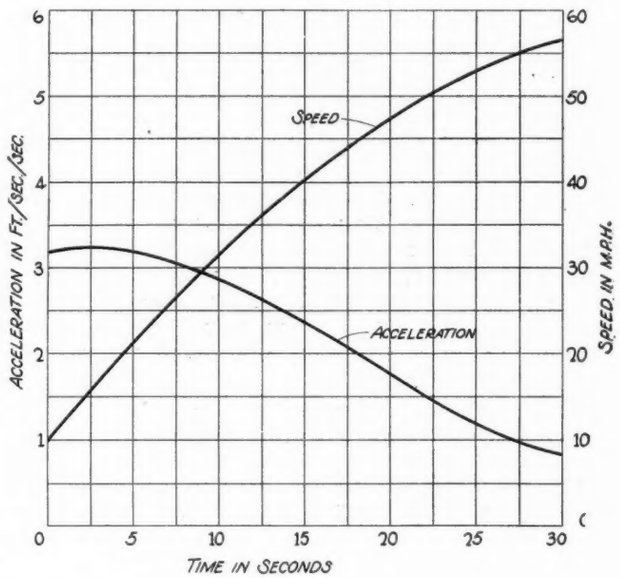
$$F = 0.85\ T\ r \times 12 \times 2/D = 20.4\ T\ r/D \text{ lb.}$$

The rolling resistance on a smooth track may be taken as equal to 20 lb. per thousand, and the coefficient of air resistance as 0.003. Then, if W is the weight of the complete car with load and A its frontal area in square feet, the total resistance encountered by it at any car speed V is

$$R = (20 \times W/1000) + 0.003\ A\ V^2 \text{ lb.}$$

In this equation it is desirable to express the car speed V in terms of the engine speed n in revolutions per minute. It is evident that

Fig. 2



$$V = (n/r) \times (D\pi/12) \times (60/5280)$$
$$= (n\ D)/336\ r$$

and

$$V^2 = (n^2\ D^2)/112{,}800\ r^2$$

Substituting this in the above equation for R we get

$$R = (20\ W/1000 + (A\ n^2/37{,}600{,}000)$$
$$= (20\ W/1000 + A\ (n/1000)^2/37.6 \text{ lb.}$$

In Fig. 1 the curves of propulsive force F and of total resistance R are drawn in for a car weighing with load 3200 lb. having a frontal area of 24 sq. ft., a rear axle reduction of 4.5 to 1 and rear wheels 30 in. in diameter, the car being equipped with an engine having a maximum torque of 139 lb.-ft. and which drops to 114 lb.-ft. at 3000 r.p.m. The vertical distance along any ordinate between the R curve and the F curve is a measure of the acceleration, because the propulsive force which is not required for overcoming traction and air resistance

Plotting Car *Acceleration*

By P. M. Heldt

will serve to accelerate the car and the acceleration will be directly proportional to it. These differences are represented by the acceleration curve drawn in.

A force of 1 lb. will accelerate a mass of 1 lb. 32.16 ft. p.s.p.s. Hence

$$a = (32.16/W)\ f$$

The value of f, of course, is the difference between F and R, for which an expression has been found already, and substituting this in the above equation we get,

$$a = \frac{32.16}{W}\left\{\frac{20.4\ T\ r}{D} - \frac{20\ W}{1000} - \frac{A\ (n/1000)^2}{37.6}\right\}$$

A separate curve for the acceleration has been drawn in in Fig. 1, the ordinates of which are equal to the differences between the corresponding ordinates of the propulsive force and the resistance curves. In this case, since the ratio $32.16/W = 32.16/3200$ is almost exactly 1/100, the scale for the acceleration curve is 1/100th as large as the scale of forces and resistances.

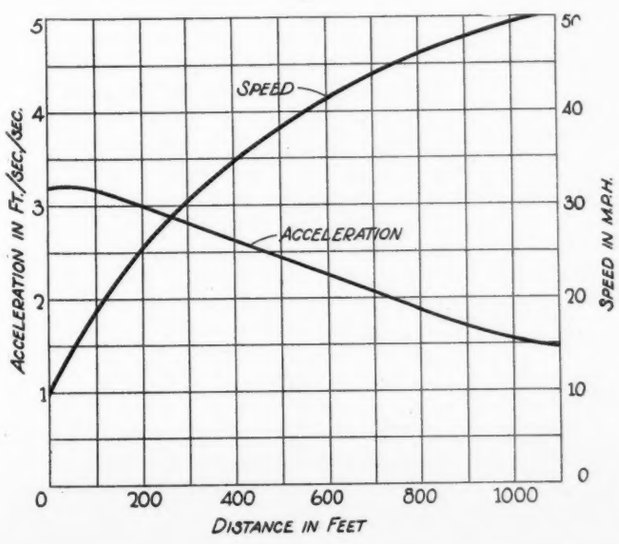
At the top of the chart is drawn in a car-speed scale, which, since the wheel diameter and reduction ratio are fixed, is directly proportional to the engine speed scale. It will be noticed that in this particular case the acceleration is practically constant from 10 to 25 m.p.h.; then it begins to drop off, and from 35 m.p.h. on the rate of decrease is almost constant.

In Fig. 1 we have therefore a curve connecting the car speed and the acceleration. From this it is possible to obtain the necessary data for constructing curves connecting the acceleration and the elapsed time and the acceleration and the distance covered. To this end we make use of the two fundamental relations

Speed (gain) = Acceleration × time, and

Distance = average speed × time.

Fig. 3



From the first we get,

Time (to accomplish a speed gain) = Speed gain/acceleration

Referring to the acceleration curve in Fig. 1 it will be seen that while the car is accelerating from 10 to 20 m.p.h., the acceleration is practically constant, its average value being 3.2 ft. p.s.p.s. This is a gain of 10 m.p.h. or

$$10 \times 1.466 = 14.66 \text{ ft. p.s.}$$

The time required to make this gain in speed is evidently,

$$14.66/3.2 = 4.58 \text{ s.}$$

For the rest of the curve, since the acceleration varies, it is best to calculate the times for smaller increments in speed, say, 2 m.p.h. For instance, from 20 to 22 m.p.h. the average acceleration is 3.16 ft. p.s.p.s. Since 2 m.p.h. is equal to

$$2 \times 1.466 = 2.932 \text{ ft. p.s.}$$

the time required for this increment in speed is

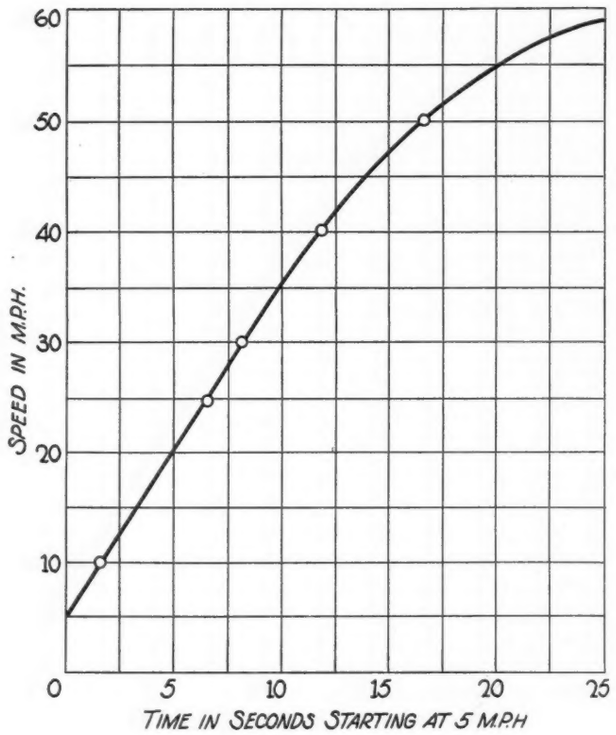
$$2.932/3.16 = 0.928 \text{ s.}$$

The times required for all increments of speed of 2 m.p.h. up to 56 m.p.h. have been calculated in a similar manner and the curve Fig. 2 has been drawn from the data thus obtained. It will be seen that the first part of the curve is very much like the speed-acceleration curve of Fig. 1, in that the acceleration is substantially constant for quite a while, increasing slowly at first and then decreasing. The latter part of the curve is quite different from that of Fig. 1, however, in that while in the latter the acceleration seems to end rather abruptly, in Fig. 2 its curve is seen to be long drawn out. Fig. 1 is somewhat deceptive in this respect, as one is apt to regard the abscissas as measures of time, whereas in fact a given increase in speed takes a much longer time as the maximum speed is approached than near the starting point. Theoretically the curve in Fig. 2 should run out to infinity, as is shown by the consideration that with an acceleration of "next to nothing" it takes an almost infinite time to accomplish a measurable gain in speed, and before the acceleration becomes zero it passes through values of all degrees of smallness.

Distance Acceleration Curve

Data for the distance acceleration curve can also be obtained from Fig. 1. As the speed increases from x to $x + 1$ m.p.h. it increases from 1.466 x to 1.466 $(x + 1)$ ft. p.s. The gain in speed is therefore 1.466 ft. p.s., and if the average acceleration during this period in ft. p.s.p.s. is denoted by a, the time occupied is $1.466/a$ second. The average speed during the period is 1.466 $(x + \frac{1}{2})$ ft. p.s. Multiplying this by the time occupied we get the distance covered,

Fig. 4



$$D = (1.466/a) \times (x + \tfrac{1}{2})\ 1.466$$
$$= 2.15\ (x + \tfrac{1}{2})/a$$

Referring to Fig. 1, in accelerating from 10 to 11 m.p.h., the value of x is 10 and that of a, 3.18. Hence the distance covered is

$$(2.15 \times 10.5)/3.18 = 0.69 \text{ s.}$$

The distance covered for each mile-per-hour speed increase can be calculated in this way, and from it the curve Fig. 3 can be plotted. Toward the very end, when the rate of acceleration varies greatly during the period, the method is not so accurate, and it is therefore well to stop at a point several miles per hour below the speed limit of the car. This portion of the acceleration curve is actually of little interest.

In both Figs. 2 and 3 speed curves are also drawn in. The data for these curves are obtained from Fig. 1, which gives the acceleration corresponding to any car speed.

Acceleration figures for American cars are generally given in the form "from — m.p.h. to — m.p.h. in — second," several sets of figures being given. In France it is customary to plot speed-distance curves, and it is sometimes desirable to compare acceleration data given in these entirely different terms. A method of doing this is given in the following.

There were published recently acceleration figures for an American eight-cylinder car with a piston displacement of 298 cu. in. The acceleration data for this car are as follows:

5-25 m.p.h.	6.51 s.
10-30 m.p.h.	6.60 s.
10-40 m.p.h.	10.38 s.
10-50 m.p.h.	15.36 s.
10-60 m.p.h.	22.52 s.

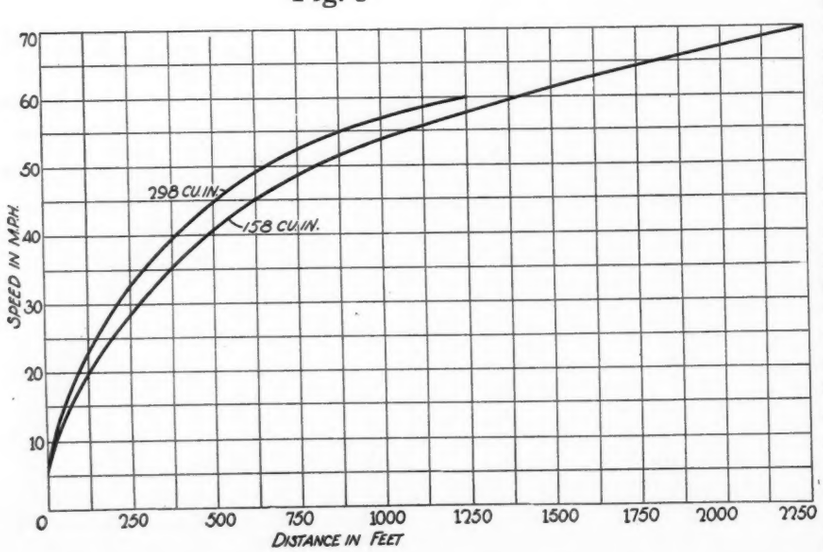
It follows from the above by subtraction that acceleration from 30 to 40 m.p.h. requires 3.78 s.; from 40 to 50 m.p.h., 498 s., and from 50 to 60 m.p.h., 7.16 s.

Time-Speed Curve

The above data can be used for plotting points of a time-speed curve as shown in Fig. 4. Through these points it is not difficult to draw the curve. From this curve we obtain data for a distance-speed curve in the same manner as previously. For instance, we see from Fig. 4 that during the first two seconds the speed increases uniformly and its average value is 8 m.p.h. This corresponds to $8 \times 1.466 = 11.73$ ft. p.s. and during the two seconds 23.46 ft. are therefore covered. The distances covered every two seconds are calculated in a similar way and the curve Fig. 5 is then plotted.

The lower curve in Fig. 5 shows the relation between distance covered and speed of a new French eight-cylinder 2.6-liter car, of which it is said that it can well stand comparison with American machines in point of sweetness of operation, silence and flexibility. Its performance will be seen to be not quite up to that of the American, but of course, one would hardly expect a machine of 158 cu. in. displecement to compare with one of 298 cu. in. in this respect.

Fig. 5



Statistics recently published give the numbers of various classes of motor vehicle in use in Czechoslovakia on Oct. 1, 1926. The total number was 39,543, including 12,800 passenger cars, 6400 motor trucks and 676 motor buses, the remainder being motorcycles and various types of special vehicles. Of the passenger cars, 57.3 per cent were Czechoslovakian manufacture, 10.1 per cent of French, 8.2 per cent of German and Italian each, and 8 per cent American. Of the motor trucks, 46.3 per cent were of Czechoslovakian manufacture, 23.5 per cent American, 17.2 per cent Austrian, and 4.7 per cent German.

Just Among Ourselves

Improvement in Marketing Methods

THE study of marketing and sales methods which factory executives have been making in the last year or so seem likely to come to a greater degree of fruition in 1928 than they have previously. There are indications that the beginning of next year's campaign will witness not only the slight readjustment of personnel which often takes place, but also the inauguration of new factory sales organization plans, particularly as related to the set-up of field forces and district control. More intensive coverage and more detailed supervision of every section of the country is being provided for in several instances, while more effective and closer merchandising aid to dealers, as regards both new and used cars, also is contemplated in several of the revised methods. The automobile factories seem to be gearing up actively to meet the 1928 competition for a greater share of the purchasing public's spending power.

* * *

No Let-up in Tax Fight

THE automotive industry is to be congratulated on the courage of its leaders. Imbued with the thorough justice of its cause, the industry is fighting through its demand for complete elimination of wartime excise taxes, despite open opposition from the Secretary of the Treasury and from the President himself. The industry is not going to be content with elimination of 1½ of the remaining 3 per cent tax. It is fighting for a principle—and that principle demands complete elimination of an unfair tax. That the industry's position will gain authoritative and powerful support is indicated by the promise made by James C. McLaughlin, representative from Michigan and member of the House Ways and Means Committee, in an exclusive statement to *Automotive Industries* last week, that he would offer a resolution on the floor of the House asking for complete repeal of the automobile excise tax. The fight is on as this is written and good hopes of victory are held by those close to the situation. Representative McLaughlin himself thinks that there is "more than an even chance" of the tax being eliminated entirely before the fight is over.

* * *

Time to Oil the Guessing Machinery

NOW is the time for all good guessers to get into action. The annual open season for guessing the volume and profit of next year's business is upon us. Already there has been some sniping; within the next few weeks all the big guns will be brought forward and a deluge of predictions, automotive and otherwise, will be upon us. The seeds of prophecy are being nourished carefully in our editorial sanctum and the views of men close to various special phases of the industry are being accumulated daily by post and visit. Another week or two, and lo! our conclusions about the automotive outlook also will be available for disagreeing with.

* * *

We Second This Motion

HIGHWAY RESEARCH BOARD, we notice, is urging immediate improvement of the 2,500,000 miles of secondary highways in the country. Last summer, our constant readers may remember, we started a campaign in a small way for greater use of secondary roads by motorists in general and especially for those just out for the air. Certainly a concerted effort at improvement of this class of roads would be a big factor in getting more people to use such roads regularly. Traffic congestion might not be reduced as much as would be thought, since increased road mileage in recent years seems to have meant more travel rather than reduced congestion. More travel, however, means more automobiles—so here's Godspeed to further improvement of the secondary road system.

* * *

It Won't be Long Now

LESS than a month away! For the twenty-eighth successive time the New York Automobile Show seems certain to surpass its predecessors in quality of products, variety of exhibits and trade interest. Still advertised and known as the National Automobile Shows, the big New York and Chicago exhibits have come to be rather automotive shows in the last two years. Not only are complete car lines shown, but fully representative exhibitions of parts, accessories, motor trucks and shop equipments also are on display. The recently added truck and shop equipment sections, together with the special trade day provisions, have done much to reawaken the business and trade interests in these two shows. There is every indication that Sam Miles will make more records in January, 1928.
—N.G.S.

30% *of* Machine Tool Repair Cost Due to *Lubrication* Neglect

Speaker at A.S.M.E. meeting says special lubricating squad improved conditions in his company's plant. Many topics of interest to automotive factory executives are discussed.

By K. W. Stillman

A VARIETY of topics of direct interest to automotive factory executives were discussed at the 48th annual meeting of The American Society of Mechanical Engineers in New York last week. Not only were there many automotive men among the 1500 members present at the meeting but a number also either presented formal papers or took an active part in the discussions which followed them.

Included in the subjects which had a most direct bearing upon automotive production problems were a symposium on hydraulic feeds for machine tools; a symposium on plant and equipment maintenance; a paper on the development of machine tools from a user's standpoint; a series of papers on the general subject of materials handling, and two sessions devoted to general management topics—one taking up production control and the other budgetary control.

In addition to these papers on production topics, F. J. Scarr, The Scarr Transportation Service, discussed the relationship between the motor truck and less-than-carload freight; a paper was given which presented the results of an analysis of strains and stresses in a wrist pin of an automotive engine; another session discussed Diesel engine design and developments, while still another included two reports by Bureau of Standards men—one on the viscosity of lubricants under pressure and the other on the effect of running in on journal bearing performance. Altogether, the meeting was quite clearly one which had a great deal of interest for automotive men.

Interest in Hydraulic Feeds

The symposium on hydraulic feeds for machine tools aroused a great deal of interest inasmuch as after a number of years of rather slow development this type of drive has, within the past year, come into decided prominence, as was well evidenced by the considerable number of machine tools exhibited at the recent Machine Tool Show at Cleveland, which, for the first time, were equipped with this type of drive.

Representatives of The Oilgear Co., The Heald Machine Co., The Cincinnati Milling Machine Co., and The National Automatic Tool Co., presented papers and the discussion which followed them was fast and furious.

One major point of dissension was concerning the relative merits of the accumulator system and the direct-connected, variable-displacement pump. Walter Ferris, vice-president and chief engineer of the Oilgear Co., was the chief exponent of the latter type of equipment. Waldo J. Guild, chief engineer, The Heald Machine Co., while recognizing the particular advantages of the variable-displacement pump, believed that a nominally constant displacement and constant pressure pump, fitted with by-pass valve for taking care of pump output in excess of momentary requirements, has peculiar advantages, particularly in the simultaneous operation of several drives.

The discussion on this particular subject was lively with exponents of both systems bringing arguments to the fore.

Get Increased Production

A number of users of hydraulically-fed machine tools gave their testimonies and in every case they asserted that they obtained increased production, longer tool life and generally better finish with hydraulic feeds than with mechanical feeds. One speaker stated that his company had been using hydraulic feeds for five years and had kept accurate records of relative performances of all types of tools. Production increases ranged from 10 to over 100 per cent over the same tools equipped with mechanical drives, with an average increase of about 25 per cent.

One of the chief reasons for this increase was given as the elimination of all lost motion at the end of the cutting stroke. There is no back lash to consider in the hydraulic mechanism and no clutch to be operated before motion can be reversed so that the proportion of actual cutting time can be considerably increased over that obtained with other types of drive.

Longer tool life is apparently caused by the cushioning effect of the hydraulic drive which causes excess leakage of the oil past the piston when high pressures are encountered in cutting, thus momentarily decreasing the speed of the tool when it encounters a hard spot in the work.

The question was raised as to how quickly hydraulic feeds could be made to operate with large machines, the speaker evidently having the idea that the flexibility of the mechanism would operate to decrease its speed when handling very heavy units.

This was answered by a representative of a company which has been supplying hydraulic drive mechanisms to the navy. Gun turrets on late battleships, this man said, weigh about 8000 tons and have a maximum speed of rotation of about 120 deg. per minute. Naval specifications for control apparatus require that these turrets shall be reversed from maximum speed in one direction to maximum speed in the opposite direction in not more than two seconds and his company has been able to better these requirements by 15 or 20 per cent.

Maintenance of plant and machine tools has ever been a bugbear to production men with its major influence on that dread item of indirect expense, so it was to be expected that the symposium on this subject should arouse a great deal of interest and evoke much discussion.

Four formal papers were presented as a basis for the discussion which covered every phase of maintenance and even got into the problem of purchasing new equipment. It was pointed out by several speakers that maintenance of machine tools is of greater importance today than ever before. One put the situation in a formula—increasingly complicated tools plus unskilled workmen equals more repair work—which seemed to express the situation very well.

The opinion was general that maintenance work, at least in so far as the term applies to mechanical repairs, should be done by a force separate from the production operators who are too much interested in output—especially if they are operating under an incentive plan—to give their machines proper attention. Not so many, however, carry this plan out to lubrication of tools, although several speakers emphasized its importance in decreasing repair costs.

One speaker said that careful records kept by his company over a period of five years indicated that over 30 per cent of a $400,000 annual repair bill was directly or indirectly caused by improper lubrication of machine tools. Now this plant has a special lubricating squad of 11 men who have the entire responsibility for all lubrication work throughout the plant and they have considerably more than paid for themselves in decreased maintenance costs.

Considerable attention was given to the extent to which a machine should be repaired before being replaced by a new tool and also to the question of servicing tools by the makers. No definite conclusions could be drawn from the discussion of the first subject although it was obvious that all who spoke on it believed that there should be some definite relation between the repair cost of an old machine and the purchase price of one to replace it.

Favor Service Charges

Machine tool makers' representatives spoke in favor of charging customers for service. They made the point that in many instances calls for service were predicated upon the improper use of machines caused by ignorance of the users and believed that those users who operated their tools properly and so had few demands for service should not be penalized by higher prices for their machines, as they would be if servicing expenses were included in selling prices. They pointed out the obvious fact, but one which, apparently, is often lost sight of by machine tool users, that someone must pay for servicing and it appears more fair to have those who require extensive service pay for it.

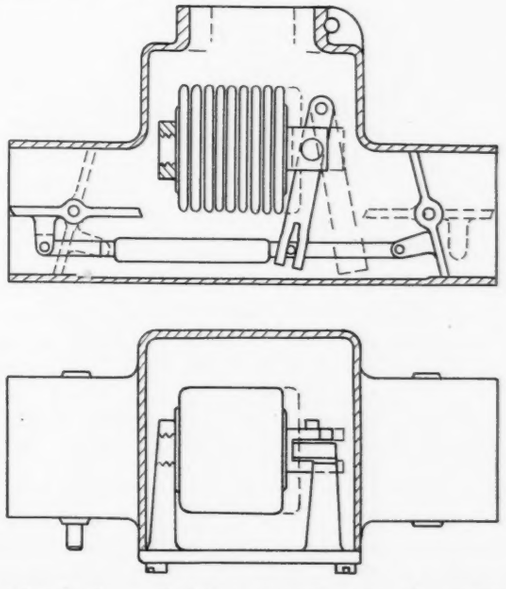
In the discussion of the papers on materials handling emphasis was laid upon the necessity of having someone in every organization specifically identified with this work—someone who could be intimately acquainted with the needs of his plant and who also was fully aware of the relative advantages of the various types of material handling equipment on the market. Such equipment should be *bought* by the prospective user rather than be *sold* to him by the maker. For any particular handling job there will usually be several types of equipment which, offhand, appear satisfactory, but in nearly every case there is only one which will best meet the requirements of the particular situation. To select this type properly requires a man sufficiently informed concerning the entire problem to be more or less independent of salesmen's arguments.

J. P. Jordan, the well-known budget expert, emphasized strongly, in the budget session, that a budget was not simply a mechanism but in fact was almost certain to prove a failure if developed as a rigid structure forced upon the organization by the chief executives of the company. He likened the properly developed type of budgetary control as a game in which the competitive spirit of executives and employees could be utilized to increase their interest in their work. He believes that the psychological effect of good budgetary control is of much more importance to the company than as a more or less mechanical aid to management.

At the session devoted to production control a paper was read which had been prepared by H. G. Perkins, formerly of the Chrysler Corp. but now with the Murray Corp. of America, which explained the methods employed by the former company to control factory overhead and keep it in line with output, which, in accordance with modern automotive practice, is based upon actual sales demand for cars.

Air Temperature Control

A CARBURETOR air temperature control device known as the Autostat has been introduced on the British market and was the subject of a paper presented to the (British) Institution of Automobile Engineers on Dec. 6. It is in the form of a T-fitting secured to the carburetor air inlet, and containing two butterfly valves and a bellows-type thermostat. The thermostat is connected to the two valves in such a manner that when one valve is fully open the other is fully closed and as the first closes the latter opens. Cold air enters the device past one valve and hot air (evidently from an exhaust muff) past the other. Great improvements in the operation of an engine when fitted with this device are claimed, with respect to distribution, flexibility, carbon formation, durability, etc. W. L. Fisher, editor of the *Automobile Engineer*, London, is one of the inventors. When used as original equipment, it is planned to design the device as an integral part of the carburetor.



Sectional views of Autostat carburetor air temperature control device

NEW DEVELOPMENTS—Automotive

Automatic Threading Machine

THE Landis Machine Co., Waynesboro, Pa., has recently developed an automatic pointing and threading machine which has been designed for rapid production of bolts and screws. The machine employs a ¾ in. Landex head, revolving and of the "pull-off" type, with a Landis chaser. The time element for the return of the forming and threading heads and indexing of the three-way turret chuck is constant regardless of pitch, diameter, length of thread or threading speed. As soon as the forming and threading operations are completed an automatic accelerated motion withdraws the spindles and indexes the turret.

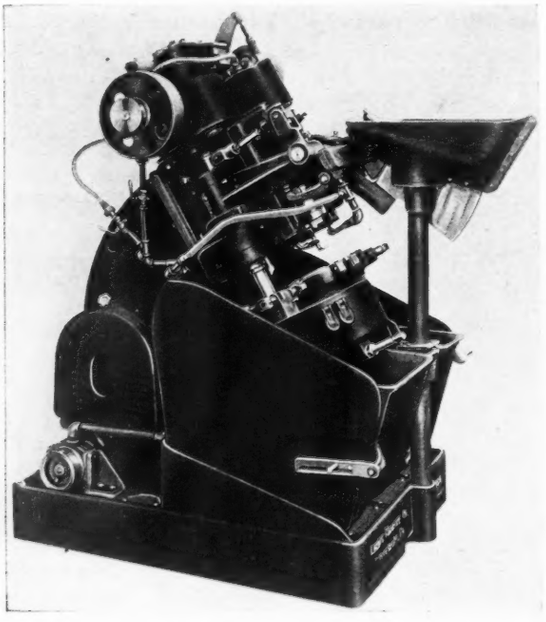
The three-station turret chuck provides for loading and unloading, cutting to length and forming the end of the screws and threading to be carried on simultaneously. The chuck jaws operate on a pivot parallel to the bolt. This centralizes and squares the bolt regardless of size variations and insures concentricity of the thread with the body of the bolt.

The machine is easily and quickly adjusted for various diameters, lengths of thread and lengths of bolt. A change of the last two requires about 10 minutes while a complete change of diameter, pitch, length of thread and length of bolt requires about 55 minutes. One set of cams cover the entire range of the machine so that retiming or adjustment are unnecessary.

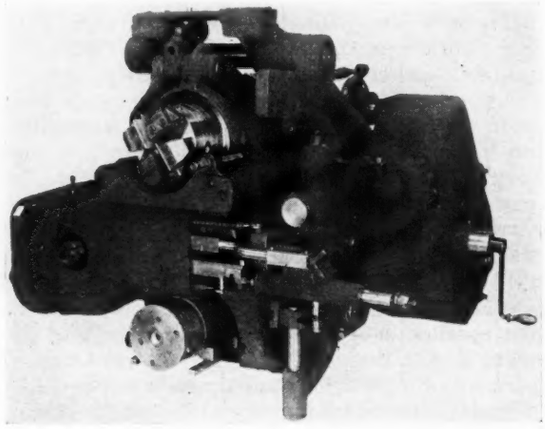
Changing the speed of the threading head requires about two minutes and effects a corresponding change of speed in the forming head but does not alter the constant speed of the indexing mechanism.

Automatic safety devices are provided to protect both the machine and the operator. The threading head is accessibly located at the front of the machine and is screwed to the nose of the spindle. The forming head is accessible when the turret chuck is in a lowered position. A clamping screw and backing up screw are removed to replace the pointing tool.

The turret chuck, with its operating mechanism—



New Landis Machine Co. automatic pointing and threading machine



Detail view of counterbalanced threading unit in Landis pointing and threading machine

a Geneva indexing movement—and the lock bolt form a completely self-contained unit fully inclosed and running in oil. The machine is hopper fed, the threading unit is counterbalanced and the forming and threading spindles are carried on Timken bearings.

The thread chasers are flooded by two streams of coolant delivered from a pump. All shafts and heavy-duty parts are made of heat-treated alloy steels. All gears and cams are inclosed with centralized lubricating systems used wherever possible. The machine is furnished for either belt or motor drive.

20-In. Mult-Au-Matic

THE Bullard Machine Tool Co. has just announced its 20-in. Mult-Au-Matic which, in addition to the five models announced previously, rounds out the line of Mult-Au-Matics to cover all ranges of work wherein work requirements are likely to justify this type of equipment.

The newest addition to the line is in general the same as the previous models with the exception of size. It provides a clear swing of 21½ in. diameter for 8 in. above the chuck face and of 12 in. diameter for chucked work extending 17 in. above the face.

The work is chucked by the operator at the loading station, is periodically indexed through each of the five working stations and returned for unloading. As in other models, six pieces are in process simultaneously. The loading station is equipped with a power-driven chuck operating unit which connects with each spindle as it comes to this station and actuates the standard three-jaw chuck.

Toolheads provided for the five working stations may be of the plain, compound, standard universal or double purpose type to provide vertical, horizontal, angular or combinations in traverse and feed. Full stroke of the head is 8⅛ in. primary movement which

Parts, Accessories and Production Tools

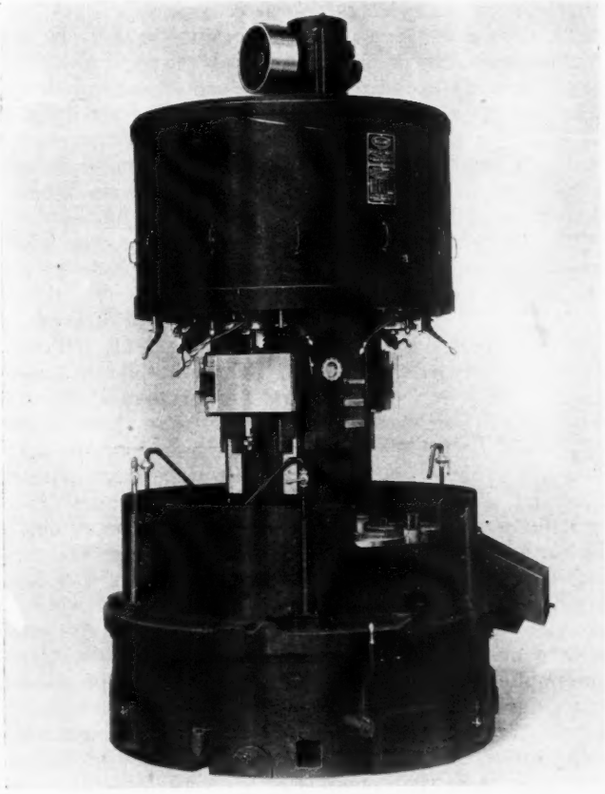
may be transformed to 4⅛ in. vertical and 4 in. horizontal.

The available spindle speeds may be independently obtained at each station and range from 5.3 r.p.m. to 131.7 r.p.m. in 25 steps. Tool feeds are likewise independently adjustable and range, in 19 steps, from .0033 in. per rev. to .1294 in. per rev.

81-in. Circular Base

The general design of the 20-in. machine includes a circular base 81 in. in diameter which contains reservoirs for cutting compound and lubricating oil with their pumps. The central column rising from this base provides an ample bearing for the work spindle carrier end, and in the upper section, face bearings for mounting the tool heads. The sixth face has an opening to give access to the gears and shafts within the column.

The work spindle carrier and spindles are of typical Bullard design. The upper compartment contains the individual feed works units which provide independent speeds and feeds for each station. The machine can



New Bullard 20-in. Mult-Au-Matic

be arranged for either direct motor drive or belt. The average power demand under normal load would require a 15 hp. motor to be mounted on top of the machine.

For simplicity in tool setting a main clutch lever is provided at each station and facilities are provided for either power or hand operation of each tool head.

Horizontal Disk Grinder

THE Syracuse horizontal disk grinder, Type D-3, is a recent product of The Porter-Cable Machine Co., Syracuse, N. Y., and is designed to burr small metal pieces of all descriptions while obtaining a flat surface.

The operator sits beside the machine, rests his arm on the guard plate, and, using his elbow as a pivot, moves his hand through a small arc at one end of which is a box containing the parts to be burred and at the other end is the revolving disk. Speed of operation is only limited by the speed of the operator. Dust is carried away by a vacuum system which deposits nearly all the dust produced in a bag attached to the machine.

Porter-Cable Syracuse Type D-3 horizontal disk grinder

For work requiring more than one-half the disk the guard plate may be removed and the auxiliary guard may be swung to one side. The iron disk is supported on a thrust bearing built into the motor. It is controlled by two-pole push button. The base, pedestal and housing are of substantial cast-iron construction.

New Shell Type Motor

THE Lincoln Electric Co. of Cleveland, Ohio, has just perfected a squirrel cage motor for use in various kinds of wood-working machinery and all the machinery requiring high-speed motors. This motor is of the so-called shell type, and all-welded design, and is made to standard dimensions. It is supplied in two sizes, 3 hp. and 5 hp. The 3 hp. unit has an external diameter of 6½ in. and an external length of 4½ in. The 5 hp. is of the same diameter and is 6 in. in external length. Both motors are manufactured for either two or three-phase, 60-cycle current and a speed of 3600 r.p.m. The stator is composed of laminated sections arc-welded together. The welding is done while the shell is under pressure and is placed in six transverse slots. The rotor is also entirely arc-welded and provided with either a straight or tapered bore. As normally used the stator is secured in the frame of the machine and the rotor is mounted on the tool shaft. If desired the stator will be supplied with six-foot leads.

A BONUS of 200,000 crowns has been granted by the Swedish Government to the Aktiebolaget Volvo in Gothenburg, which plans to place on the Swedish market a popular-priced car in a single chassis type but fitted with both open and closed bodies. A production of 1000 cars was scheduled for 1927.

Custom Body Costs *are* Reduced *by* Small Run Orders

Car manufacturers can present line of distinctive models at very slight increase in selling price by cooperating with the producers of custom body jobs.

By Robert S. Grimshaw

PRESENT-DAY practice in automobile production and sales has materially changed the position of the small body shops. Rather than being dependent upon the past custom patronage they are now more nearly dependent upon the motor car manufacturer himself. The demand of buyers for the exclusive type motor car has not decreased, but the method of contact between those concerned has changed. Automobile producers in the high-price fields have tried to cater to the patron of individual requirements by stocking a limited number of models by coach builders of merit. Thus they endeavor to keep their body types under control and at the same time satisfy the custom clientele.

The motor car manufacturer knows that a large percentage of his buyers have very distinct ideas of what looks good and pleases their fancy. If all were favored with lavish wealth the majority would follow the path of those who are able to own motor cars of special design. The only difference between the wealthy and those of modest means is the actual financial buying power.

In all lines of industry great advances are being made in the direction of meeting particular tastes without undue expense. Compare, for instance, the old-time Mission style furniture of a few years back with the beautiful period styles of today in almost endless variety of designs. Tableware, architecture, clothing, in fact almost all personal and household equipment are presented in a vast array and at a price almost all can afford. We can almost call our selection "custom" because there is so little possibility that we will ever see the same item duplicated in the surroundings of our friends.

Buyer Must be Satisfied

It would be far easier to produce one standard line of merchandise but the manufacturer knows that the public would never buy such a standardized article because the purchasers are unable to express their own tastes. The buyer must be given the privilege of indicating his preference for he is the ultimate party to be satisfied.

Sharp contrast at once greets us as we study the presentations in motor cars. Although styles tend to be standardized, occasionally, by contrast or moldings, proportion and interior treatment, we see a car that does stand out and at once gains attention. Such a model is usually a sales leader. It is not that the lines of other models are poor but rather that the public tires of duplication. A street car or a railway coach is designed solely for transportation. An automobile is, to be sure, built largely for the same purpose but it is purchased by an individual who is just as desirous of expressing his personal taste in a motor car as in a home or its furnishings.

There is a distinct demand on almost every chassis, for instance, for a car of unusual roomy dimensions, regardless of appearance. At the same time others will want a car extremely low and racy, and are willing to be a little cramped for the sake of outward appearance. What is emphasized is the need of willingness to cope with every demand from the buying public, as is being done with such chassis features as economy, pick-up, etc.

The main thought of this article is to point out how profitable relations between custom body producer and the chassis manufacturer can be developed. By this is meant that an ample supply of de luxe bodies of individual treatment should be carried along with the so-called stock model price job. These individual models must of economic necessity and for the sake of prestige be higher in price. However, through a small run order, by careful designing and engineering they can be made at a modest figure so as to be within the buying power of many persons.

Millions of dollars have been wasted on poor jobs in tool and die costs that could have been avoided if design experts had been consulted and the small run idea been tried out. The producer may have the last word in chassis from a standpoint of performance and dependability but if the outward appearance fails to attract the public eye he is beaten. By the creation of a semi-individual line of bodies he may have a very handy barometer by which to watch for future developments.

At the same time he will have a fine line of de luxe bodies to meet the demands of the most exacting, who otherwise must turn to another make of chassis. The value on the showroom floor of a car that is just a little bizarre or different is not to be overlooked. A model on exhibition that attracts attention is a fine advertisement, and for the standard line as well. The best part of the idea is that it costs the factory or the dealer nothing other than their support, for the buyer is carrying the load.

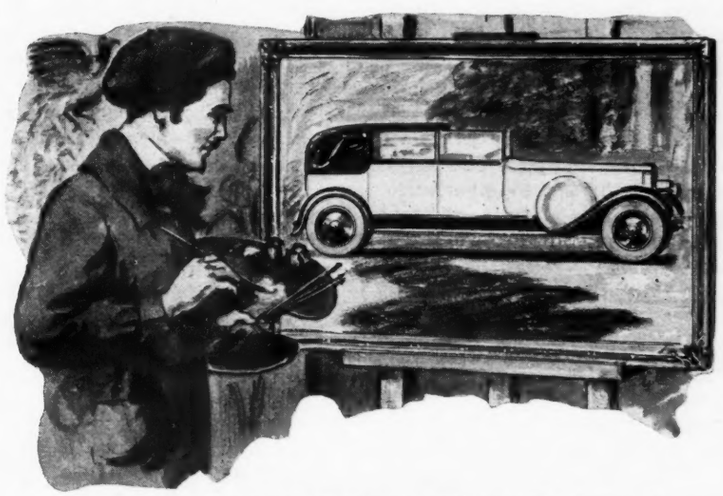
There is an undeniable trend among executives in

the automobile field to realize that their engineering organizations are concerned mainly with mechanical problems. So in trying to emphasize artistry and variety in what they have to offer, some are employing artists and others are calling upon the custom shop.

There is much to be said for the man who is working out his own ideas unhampered in his own organization. To produce an article for sale we need organization as to details but to create the ideal in design we must rely on the inborn talents of the designer who is gifted as an artist and educated in the production methods. A fine piece of statuary is not produced by an organization of air chisel operators but by the painstaking effort of a sculptor skilled and blessed with a fine sense of proportion. There should be little, if any, executive suggestion or criticism between the customer and the designer.

An executive opinion may have a voting power to outweigh all progress on a new idea but its intrinsic value may be much lower. An idea has to satisfy two main requirements—can it be produced and will it sell? In meeting these the designer's ability and the sales chart are paramount. If a design sells it is good, and the one big advantage of the small run idea is in finding out how a new suggestion will be accepted. The executive's judgment is not infallible.

The sale of the semi-individual motor car design is something that can only be considered briefly here. Salesmen ought to be aided in understanding the purpose and appeal of a design, and urged to sell it on this basis. A great deal of information is drilled into the dealer as to the merits of the chassis but the body is sometimes just something we sit in so we won't fall out. Perhaps it has been made from the same dies as a competitor's job. In selling a house the architect and builder emphasize the fine points of design and construction while the lot is considered mainly as a location. In a sense the body may be compared to the house and the chassis to the lot, but that more emphasis should be given to better body treatments in salesmanship is hardly debatable. No design or semi-individual model should be forced on a prospect, but rather he should be aided in choosing in accordance with the dictates of his own personality.



To produce an article for sale we need organization as to details, but to create the ideal in design we must rely on the inborn talents of the designer who is gifted as an artist and educated in production methods

There are many persons who will appreciate that these semi-individual models are not going to be produced in large quantities and that these few are to be well scattered around the country, so that although they may pay more it is a better investment to buy a good product than to lose in yearly model depreciation.

One dealer remarked that his chassis (over the $1,000 class) was too cheap for a small run of the individual body type. He had lost the true sense of salesmanship. He has cheapened his product in his own estimation and yet the chassis mentioned is one of the finest balanced designs that a body builder could hope for. There was no reason why he could not gain in sales at the expense of his higher priced competitors by the use of fine select types, which could not be duplicated in the higher priced chassis except for a great deal more money. On the other hand, price can be stressed too much. There never was a thing so cheap that some competitor could not sell his junk for less. It is a proved fact that interesting body styles are in demand rather than just cheap inclosures. It is worthy of note that even in the cheap car field a well designed model will sell, though it is several dollars more, if it has an individual appeal.

Ideas Can't be Cornered

Let us realize the value of body shop and designer to the motor car trade. Combines and stock control cannot corner all the brains and ideas in the world. Only through suggestive cooperation with all available agencies is the producer of motor cars going to have command of all that is new and progressive.

To try to adapt some salon design on another chassis usually produces a misfit, and to copy a success of the previous year is not progress. Some thinking chap is always bound to come out with something just a little ahead of his fellows and there is a public just ready to accept these ideas if given a chance by the small run method.

The public is going to force more and more attention on its individual requirements. If this fact were not true we would have bodies on our cars now of the milk wagon period style.

Many owners are already waking up to the fact that depreciation is a terrible expense that must be charged up to operation. How long will they stand for the yearly model rampage, if they find they can buy a small run model which will weather several years and still have a style of its own?

The fabric body, with its many possibilities of new effects and designs is worth watching. These possibilities can only be judged when a fair trial is given in the public proving ground. America has not yet had a chance to really grasp the advantages of this construction.

Of course it is recognized that the stock model will always predominate in production but, while plowing through the sea of quantity production, it is not a bad idea to look through the telescope of the future. The semi-custom run model idea costs practically nothing other than a little executive thought in a different channel. There is not a reason why the semi-custom model is not applicable to all cars in a varying degree over and above the $1,000 class.

Competition breeds new ideas and as competition increases more manufacturers will turn to custom jobs.

New Olsen Balancer Operates on Electric Contact Principle

Direction of unbalanced movement indicated by spark from rotating electrode, and its amount measured by producing equal, measurable counter movement. Operation is simple.

THE Tinius Olsen Testing Machine Co. of Philadelphia exhibited at the recent Power Show in New York a further development of its centrifugal balancing machine which was first exhibited at the Steel and Machine Tool Exposition in Detroit in September.

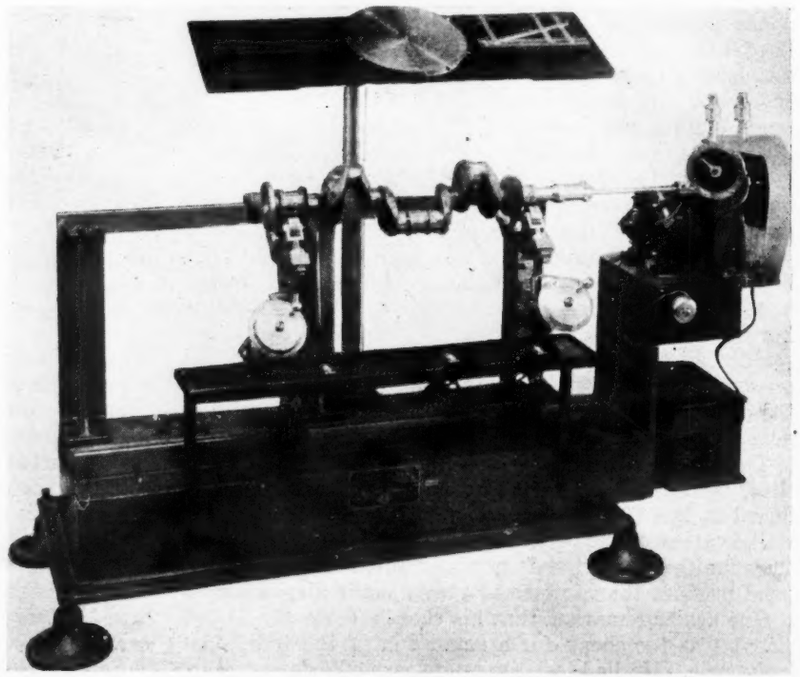
As shown by the photographic illustration herewith, the machine comprises a cast-iron base, along the center of which extends a machined base rail. To this base rail are fastened two supporting standards, which are forked at their upper end and carry rollers on which the part to be balanced is supported. The two standards can be moved any distance apart within the limit set by the length of the base, to accommodate parts of different lengths. In each supporting standard, directly above the foot which clamps to the base rail, there is a flat spring, which enables the standard to vibrate freely in a transverse direction under very slight periodic impulses.

The part to be "balanced" is driven by an electric motor mounted on a bracket at the right hand end of the machine, through suitable gearing and a light shaft and two universal joints of a simple type. The speed at which the part is rotated is of some importance. If it is driven at too low a speed, the centrifugal force developed in consequence of any small unbalance may not be great enough, and the sensibility of the device consequently would be low. On the other hand, if too high a speed were used, the part tested, if it were comparatively flexible, like a crankshaft, might bend, in which case the readings obtained would be fallacious. The manufacturers have found that a speed of 130 to 260 r.p.m. gives the best all-around results.

At the back of the machine there are two pairs of electric contacts, one pair in a plane with each supporting standard. An electrical contact point is carried by an arm integral with the supporting standard and is located between two points rigidly supported from the base of the machine. One of these two points is really only a stop, not serving the purpose of an electrical connection, and the movable contact on the supporting standard rests lightly against this stop when the machine is not running. The other, live electrical contact is then only about 0.001 in. from the movable contact. The reason for adjusting the contacts so closely is that then a very slight degree of unbalance of the part under test will suffice to bring the stationary and movable points in contact when the machine is running.

Driven from the same gearing as the part under test is a rotating electrical contact with graduated dial, similar to the device used in ignition testing. The electrical part of the machine is completed by an induction coil with magnetic vibrator and a small battery. The primary winding of the coil, the battery and the contact device on the back of the balancing machine are included in the primary or low-tension circuit, and the secondary winding of the coil and the rotating contact device are included in the secondary or high-tension circuit. The movable terminal of the rotating contact device rotates at the same speed as the shaft under test.

If the part that is being tested on the machine is out of balance, a radial rotating force will be created, but since the supports are free to vibrate only horizontally, only the horizontal components of this force are effective in causing vibration. The stationary electrical contact at the back of the machine is on the forward side of the movable contact, hence the two contacts will come together when the direction of unbalance is hori-



Olsen Balancing Machine

zontal and to the side of the part away from the contact points. This direction is indicated by that part of the dial at which the spark occurs. Of course, the contact lasts for a brief period of time, and usually two or three sparks occur in quick succession, over an arc of circumference, and the direction of the unbalanced moment corresponds to the center of this arc.

On the table at the front of the machine there are two small switches, by means of which the primary circuit can be closed either through the contact points on the left or through those on the right of the machine (or through both simultaneously). Thus first the direction of the unbalanced moment at one end of the part under test will be determined, and then that at the other end. Strictly speaking, of course, not the direction of the unbalanced moment at the end of the shaft, but that of the unbalanced moment at the point of support is being determined.

Unbalance Measured

Next the amount of unbalance is measured, by means of two sliding weights alongside of the two supporting standards. These sliding weights are supported on coarse thread screws which can be turned by means of crank handles fitted into aluminum crank disks, as shown in the illustration. For convenience in operation, the screws are mounted at an angle. The edges of the aluminum disks are graduated in circular measure and an arm with a zero mark extends from the supporting standard. When the sliding weight on one of the supporting standards is in the zero position, the center of gravity of the standard is directly over its point of support. As the weight is moved toward the rear by the crank handle, a moment to one side (the rear side) of the point of support is created, and this moment is increased by moving the weight farther to the rear until it just balances the unbalanced moment due to the centrifugal force, at which point the sparking at the rotating contact ceases. The unbalanced moment then is measured by the displacement of the sliding weight from its neutral position. One revolution of the crank handle corresponds to an unbalance of 1 oz.-in., and the circumference is divided into 20 parts, so that each scale division (which is nearly an inch long) represents an unbalanced moment of 0.05 oz.-in. The degree or amount of unbalance is thus determined successively at both points of support.

Means of Adjustment

Owing to the fact that it is difficult to maintain the center of gravity of the supporting standard directly above its center point of support, especially if the machine is roughly handled in shipment, etc., means of adjustment are provided. Some distance above the flat spring, arms extend from the supporting standard horizontally to both sides, and coiled springs connect the ends of these arms with the base. The tension of each of these arms can be adjusted individually, and thus the supporting standard brought back to a position centrally over its support.

By the methods described above the direction and amount of unbalance of the crankshaft (or other part) at the points at which it is supported in the balancing machine are determined. However, the corrections usually have to be made at other points along the length —in a crankshaft, for instance, on the crank arms, which are located between the points of support in the machine—and at these points the direction and amounts of unbalance are different from those at the points where they were measured.

The amount and direction of unbalance in each plane of correction depend upon the amounts and directions of unbalance in the measuring planes and the position of the plane of correction relative to the measuring planes. It is therefore necessary to transfer the unbalance from each measuring plane to the plane of correction, and to there combine the two resultants thus obtained by the principle of the parallelogram of forces, which operations are performed mechanically in a very simple way by means of the instruments mounted conveniently on a table directly above the machine, as shown in the photograph.

Two Transfer Instruments

There are two transfer instruments, one of them serving to transfer the amount of unbalance from each plane of measurement to the plane of correction near the right hand end, the other to transfer the amount of unbalance from each plane of measurement to the left hand plane of correction. It will be noticed that each of these transfer instruments comprises three vertical scales, the horizontal distances between which are proportional to those between the plane of correction and the two planes of measurement respectively. For transferring the amount of unbalance from the right hand plane of measurement to the right hand plane of correction, for instance, the left hand end of the slider is moved into the zero position and that part of the slider directly over the scale representing the right hand measuring plane is moved to a point on the scale representing the amount of unbalance in this plane. The point on the scale representing the right hand correction plane where the slider crosses it then is the corresponding amount of unbalance in the right hand plane of correction. In a similar way the amount of unbalance in this plane of correction due to the amount of unbalance in the left hand measuring plane is determined.

Two Forces Active in Plane

We now have two forces active in the plane, but they generally are not in the same direction. If they happen to be in the same direction their resultant can be found by mere addition, and if they happen to be in opposite directions, by subtraction. If the angle between the two forces is other than 0 or 180 deg., they cannot be combined so readily, and use is then made of the angle computing instrument shown in the center. This consists of a circular disk of brass having concentric circles inscribed upon it which measure the distance from the center, and also radial lines, which measure angular distances.

There is a rotating arm or pointer on the face of the disk, the pivot of which is capable of being moved from the center of the disk radially outward. The pivot of this arm is first slid out from the center a distance proportional to one of the unbalanced moments in the plane of correction. Then the arm is swung around through an angle equal to the angle between the two unbalanced moments in the plane of correction. Then a distance is read off along the arm from its pivot point proportional to the second unbalanced moment, and the point just below this on the brass disk represents the resultant of the unbalanced moments in the plane of correction, as regards both direction and amount. These values can be read off directly, and they, of course, represent the amount of correction required and the angular position in the plane of correction where it must be made. The operation, while somewhat tedious to describe, is in fact quite simple and can be performed very quickly.

U. S. Exports of Cars, Trucks, Tires and Parts

COUNTRIES	PASSENGER CARS										TRUCKS					
	Up to $500		$500 to $800		$800 to $1,200		$1,200 to $2,000		Over $2,000		Up to 1 Ton		1 to 2½ Tons		Over 2½ Tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Austria																
Azores and Madeira Islands			14	$7,359							2	$918				
Belgium	48	$21,044	236	$114,293	904	$806,072	149	$196,755	23	$50,617	384	$157,368			1	$4,070
Bulgaria			3	1,569			1	1,074								
Czechoslovakia			16	9,361	11	9,199	3	3,852	1	2,106						
Denmark and Faroe Is.	48	21,045	74	40,682	254	193,189	85	112,427	20	46,878	99	39,701	6	$8,084	1	1,950
Esthonia					4	3,016	3	3,390	2	5,674						
Finland			13	9,322	48	40,642	27	32,450	3	6,994			7	7,531	1	2,539
France					60	52,525	7	11,028	27	58,822	10	4,590	2	1,842		
Germany	4	1,436	39	29,575	204	169,010	88	103,117	65	150,825	4	3,279	6	7,143		
Gibraltar																
Greece	1	500	2	1,210	35	27,459	7	9,637	6	15,641	20	15,296	1	1,293		
Hungary					18	14,798	10	11,100	1	2,036	6	3,851	8	10,217	1	3,650
Iceland					1	826										
Italy			7	4,319	14	10,778	10	13,989	4	11,089						
Latvia					2	1,728			4	16,389						
Lithuania					5	4,399	4	5,781								
Malta, Gozo and Cyprus Is.			1	719	2	1,732	1	1,000								
Netherlands			26	15,991	159	78,981	34	40,036	19	38,961			13	15,648		
Norway			7	4,172	26	23,096			1	2,716	1	797	13	26,471	3	9,720
Poland and Dantzig			15	8,601	28	21,241	6	8,654	3	6,385						
Portugal	5	2,375	26	12,470	10	9,143	10	12,310	4	7,444	64	30,923	2	2,506		
Rumania			178	99,860	35	28,002	15	18,522	10	26,496			1	1,070		
Russia			6	3,300			28	29,897	8	15,932						
Spain			161	109,638	236	210,922	131	164,877	43	101,115	602	264,219	31	34,026		
Sweden	1	500	9	5,744	167	134,381	83	104,727	9	17,532	13	9,237	15	20,878		
Switzerland			53	33,251	39	30,518	21	25,380	16	30,590			4	4,552		
Turkey	6	2,850	10	7,020	17	14,211	12	12,487	2	5,245	9	5,682	1	1,015		
United Kingdom	8	3,703	349	165,056	131	107,124	86	105,075	41	98,985	503	225,043	64	84,165		
Irish Free State			3	2,365	4	3,416	1	1,260								
Yugoslavia			10	5,122	8	6,013										
United States																
British Honduras	2	750			2	1,893										
Canada	203	44,893	394	251,688	337	293,493	176	246,855	80	234,048	176	121,949	251	277,622	37	110,963
Costa Rica			5	3,770	10	8,483	10	12,601	1	1,674			2	1,722		
Guatemala			2	1,480	11	8,718	13	18,649	2	5,185	8	6,055	23	31,185	1	2,919
Honduras			4	2,841							2	1,180	6	7,980	1	1,750
Nicaragua	1	350			2	2,100	1	1,318			4	2,395	1	1,407	1	3,192
Panama	2	500	14	7,154	26	21,532	13	25,514	19	50,600	10	7,970	13	19,276	1	5,695
Salvador	1	225			12	10,042	2	2,533	2	4,449					4	14,893
Mexico	141	53,048	129	80,934	88	87,364	37	57,158	25	51,523	54	30,329	20	29,108	4	12,902
Newfoundland	1	400														
Barbados					3	2,302										
Jamaica			7	3,165	12	10,754	4	4,929	3	7,312	5	4,591	2	2,502		
Trinidad and Tobago					3	2,475	2	3,252	1	1,700	1	749	1	1,052		
Other British West Indies	5	555	3	1,990	3	2,676	1	1,578			7	3,657				
Cuba	7	2,203	85	49,685	79	73,832	54	79,690	28	81,366	64	37,759	45	56,412	9	29,008
Dominican Republic	1	200	11	6,625	25	19,527	15	15,098	3	6,632	20	10,664	2	2,735		
Dutch West Indies			2	1,356	2	1,760	3	3,620	1	2,341	5	3,501	1	1,339	2	8,000
French West Indies			4	1,984	3	2,358					4	1,912				
Haiti					12	10,995	5	5,533	1	2,650	5	3,938	2	3,029	1	4,750
Virgin Islands											1	100				
Argentine	960	357,850	677	350,355	716	519,367	172	210,295	78	216,774	584	336,283	206	359,634	23	69,008
Bolivia			2	1,135	7	5,329	3	3,402			3	2,845	7	10,875		
Brazil	398	149,874	78	45,162	231	198,086	79	90,271	44	121,582	768	348,771	40	54,220	3	7,265
Chile			14	9,175	29	22,497	37	46,910	14	35,778	7	4,470	16	23,562		
Colombia	3	2,391	13	8,859	25	22,043	36	43,701	23	62,009	9	8,193	53	89,887	5	17,208
Ecuador					2	1,476	2	2,424	4	8,378			3	4,139		
British Guiana					2	1,795										
Dutch Guiana																
Paraguay					2	1,858	3	3,621								
Peru	1	400	7	4,483	24	19,356	8	9,090			19	14,365	27	37,619	3	6,373
Uruguay			99	50,481	98	84,155	31	35,800	6	17,110	126	60,920	15	22,720	11	48,331
Venezuela	1	187	9	5,946	19	18,136	32	37,872	9	25,825	11	9,211	9	16,759	5	9,930
Aden					2	1,485										
British India	1	500	37	25,061	193	159,645	21	26,629	8	17,294	72	53,793	39	36,852		
Ceylon					28	22,478	2	2,200			4	3,985	28	41,941	2	3,900
Straits Settlements			7	4,720	27	23,850			1	2,480	4	3,602	6	6,509	2	3,318
China			17	12,321	30	27,373	10	12,544	4	8,718	7	5,913				
Java and Madura	10	4,619	353	177,487	124	107,872	81	104,301	15	37,173	389	182,615	26	23,203	1	1,713
Other Dutch East Indies	3	1,300	21	12,796	52	41,763	5	7,318	6	11,763	20	12,775	1	2,039		
French Indo-China					1	857										
Hejaz, Arabia and Iraq					1	735	2	2,298			1	1,015				
Hongkong			5	3,570	4	3,772										
Japan	31	13,243	136	88,566	65	60,616	37	46,769	19	53,045	24	17,344	14	20,408	1	2,396
Kwantung											19	13,621	1	1,248		
Palestine and Syria			12	7,583	39	27,620	14	16,480	1	3,311	6	5,001	3	3,427	2	12,550
Persia	50	24,242	4	2,596	6	4,902					20	9,180				
Philippine Islands	67	31,489	136	82,467	124	103,721	31	42,828	6	13,276	118	57,753	80	95,402	2	4,290
Siam			12	9,255	2	1,755	1	1,228			8	6,183	3	2,805		
Turkey	2	718			4	3,391										
Other Asia					1	790										
Australia	2,117	755,549	1,063	522,442	622	494,519	319	381,807	70	146,683	1,635	766,314	212	239,896	12	23,484
New Zealand	3	1,572	131	70,028	165	137,480	33	42,882	3	6,500	65	32,323	38	44,316	4	8,296
British Oceania			6	3,845	8	6,197	2	2,787			2	956	1	1,065		
French Oceania	1	200														
Other Oceania																
Belgian Congo			1	486	9	6,588										
British West Africa			14	9,151	17	13,686	8	10,280			33	14,259	281	367,604		
British South Africa	454	176,242	173	115,791	511	405,793	313	354,734	17	36,750	298	149,233	89	117,503	7	20,378
British East Africa			4	2,665	15	11,986	8	8,942	2	3,875	21	16,898	3	3,300		
Canary Islands					14	10,815	2	2,312	3	5,760	2	1,498	4	4,914		
Egypt			122	70,445	70	54,275	15	18,847	5	12,485	62	30,992				
Algeria and Tunis			2	1,266	4	2,929										
Other French Africa					5	4,085					2	956	2	2,558		
Italian Africa																
Liberia											1	635				
Madagascar																
Morocco			7	3,850	13	11,724	5	6,360			4	1,836	3	3,758		
Portuguese East Africa			1	532	27	21,653	4	4,692			1	895	5	4,469	2	5,999
Other Portuguese Africa			5	3,137	10	7,495					12	8,514				
Spanish Africa					3	2,652							1	1,201		
Total	4,587	$1,676,953	5,086	$2,809,327	6,403	$5,241,325	2,474	$3,086,777	816	$2,014,521	6,440	$3,180,800	1,759	$2,305,643	153	$460,440

Canadian Exports for October, 1927

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS						TRUCKS		PARTS	COUNTRIES
			Casings		Inners		Solids		Up to $500		$500 to $1,000		Over $1,000					
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
		$12,570	686	$7,887	573	$6,311												Austria
		582	77	760	47	81												Azores and Madeira Islands
		130,503	2,431	33,863	560	1,895					10	7,672					9,429	Belgium
		437	10	140	10	20												Bulgaria
		4,780	382	7,431	74	192	52	2,425										Czechoslovakia
		160,618	4,834	57,530	2,652	5,305	9	226									3,721	Denmark and Faroe Is.
		440																Esthonia
		39,965	330	5,830	162	408												Finland
		108,274	1,248	15,865	459	1,107	58	1,389			2	1,183						France
1	1,000	851,599	12,697	157,987	8,731	26,595	64	1,956			4	3,149	2	2,986			50,403	Germany
											1	956						Gibraltar
		10,215	2,042	28,596	2,743	5,746	54	2,568										Greece
		16,122	908	10,839	1,145	2,111												Hungary
		471	54	1,016	20	38												Iceland
		25,731	4,227	57,125	2,008	4,458	116	1,973					1	1,492				Italy
		2,987	75	948	79	208												Latvia
		31	87	1,136	50	96					2	1,587						Lithuania
		2,227	63	519	64	90			6	2,621	4	2,437			19	$7,740		Malta, Gozo and Cyprus Is.
		155,455	3,738	54,853	2,011	4,375			4	1,504								Netherlands
		24,876	407	5,150	240	510	39	1,311	2	740	8	5,015	4	4,970			95	Norway
		2,866	2,307	26,357	1,576	2,975												Poland and Dantzig
		16,408	1,548	17,529	1,586	3,312												Portugal
		14,223	3,559	26,899	4,953	9,610							4	4,566				Rumania
		63,762	45	1,320	52	237												Russia
		126,801	13,101	171,619	11,715	23,498	245	10,840										Spain
1	1,365	61,182	3,056	45,983	1,722	3,899					5	4,438					195	Sweden
		12,038	2,069	37,560	1,472	5,188	10	723			1	572					200	Switzerland
		6,021	629	8,371	472	880			5	2,084	10	7,814			2	774		Turkey
2	2,729	296,215	5,718	98,126	544	1,448	303	11,077	30	13,829	384	245,818	119	152,075	1	1,140	6,152	United Kingdom
		7,965	256	3,337	866	945	4	66									253	Irish Free State
		585	531	6,384	533	1,105												Yugoslavia
									36	7,570	8	5,470					10,378	United States
		1,072	57	525	142	254			1	411								British Honduras
2	3,801	1,882,757	1,259	21,038	4,493	7,984	135	4,079										Canada
		5,736	4,018	6,542	691	2,049			7	2,882			2	2,587	4	1,467		Costa Rica
		18,583	585	11,751	284	793			5	1,995	1	570			12	4,646		Guatemala
		2,662	90	1,854	102	383	10	611										Honduras
		2,484	74	968	55	115	2	37					2	2,345				Nicaragua
		17,844	1,319	13,466	557	1,627	18	411	40	16,398	2	1,127	14	17,447	100	41,470		Panama
		4,863	284	5,418	333	977	14	610	4	1,621	3	2,065			4	1,549		Salvador
1	885	68,002	7,741	86,710	7,262	11,017	315	9,018			1	972	14	16,954				Mexico
		986	54	737	86	174											19	Newfoundland
		2,513	86	425	58	82			8	3,390	5	3,167			4	1,661		Barbados
		25,786	81	1,820	103	203	22	787	18	7,294	15	13,245	1	1,137	26	10,753	119	Jamaica
		4,591	49	694	31	75			9	3,935	15	9,481			2	1,194	71	Trinidad and Tobago
		5,722	32	437	19	45	2	42	3	1,376	6	4,036			2	774		Other British West Indies
2	2,975	44,321	7,659	79,440	8,456	13,617	478	18,490			10	7,410	8	8,868			230	Cuba
		21,046	1,087	17,159	268	895	24	1,388					4	4,547				Dominican Republic
		4,027	387	4,700	489	949	12	760			1	765			6	2,323	91	Dutch West Indies
		1,650	115	1,357	50	111			2	810								French West Indies
		4,763	497	7,479	453	1,134			2	958	3	2,294	1	1,137	10	3,871		Haiti
		653	36	256	63	88												Virgin Islands
		322,073	19,194	212,653	13,737	23,922	1,478	17,060	15	7,382	43	32,875	63	75,870			762	Argentine
		6,178	160	3,452	174	529	4	185			3	1,686			8	3,136	28	Bolivia
12	14,000	153,794	5,806	59,717	1,884	8,805	138	5,464	6	2,874	38	29,431	2	2,848				Brazil
		42,875	2,628	40,771	2,326	5,349	24	692	22	9,479	10	6,466	13	15,831	60	23,791		Chile
		52,265	3,481	69,038	3,822	10,870	30	1,685	19	7,953	5	3,823	18	21,238	20	8,294	24	Colombia
		2,471	407	5,984	472	1,112												Ecuador
		1,234							4	1,642	6	4,184			2	838	448	British Guiana
		410	12	80														Dutch Guiana
		1,646	461	4,650	144	222	2	91	3	1,273					8	3,097		Paraguay
		24,144	1,948	35,414	1,767	12,444	59	1,505	12	4,887	9	6,278			28	13,000		Peru
		48,893	1,908	22,580	845	1,953	37	1,751	33	15,967	11	6,906	6	7,948			30	Uruguay
		24,052	4,050	76,743	3,648	10,105			15	6,019	17	13,334	2	2,273	20	7,840		Venezuela
		779	10	140	10	19									2	776		Aden
		115,117	4,171	51,292	1,214	3,358	157	3,930	115	49,128	81	69,005	36	42,815	379	144,745	2,249	British India
		18,635	1,397	21,565	1,125	3,013	44	1,912	26	10,502	37	23,336	3	3,226	34	15,617		Ceylon
		63,814	3,468	23,107	503	1,221	56	1,931	24	11,496	35	18,987			12	6,688	47,110	Straits Settlements
		20,422	2,590	29,445	2,136	4,009	89	1,642			19	14,532	4	4,601				China
		61,560	3,447	39,033	1,563	3,607	40	1,531										Java and Madura
		9,181	1,300	11,526	752	1,195			52	24,908	30	25,860	37	47,343			22,586	Other Dutch East Indies
		1,018	10	209														French Indo-China
		5,920	294	4,803	302	632			27	11,252	2	1,109			42	16,261		Hejaz, Arabia and Iraq
		22,787	6	109	6	15			5	2,427								Hongkong
2	2,809	463,457	7,530	70,855	8,741	13,596	1,197	22,241	16	6,996	15	13,484	22	26,106			3,751	Japan
		2,088	97	2,050	39	97												Kwantung
		10,026	983	16,281	750	1,797	4	183			19	14,677					54	Palestine and Syria
		5,192	32	1,029	20	39												Persia
		84,948	7,783	101,262	9,557	21,634	4,045	58,330										Philippine Islands
		6,722							6	2,910					2	1,114	9,597	Siam
		2,473	75	1,036	4	11												Turkey
		192																Other Asia
		348,894	6,161	95,004	1,487	4,744	468	27,589	94	35,388					64	36,415	54,420	Australia
		70,636	1,017	12,039	149	413	81	3,306	40	17,431	118	73,401	26	34,410			15,711	New Zealand
		2,083	1	31	2	5												British Oceania
		545	13	242	4	13	6	258										French Oceania
											3	1,875	1	1,185			524	Other Oceania
									1	402	2	1,292	2	2,172				Belgian Congo
		41,862	637	9,011	668	2,935			17	7,862	6	4,100	2	2,622	48	17,376	200	British West Africa
		162,437	2,898	30,045	1,416	3,364	61	2,486			23	12,204	5	5,862			9,182	British South Africa
		21,706	142	2,472	677	1,721			22	9,196	34	18,793			136	52,114	2,414	British East Africa
		8,836	583	9,903	212	538	4	459	2	847			1	1,210	4	1,549		Canary Islands
		66,306	874	13,602	926	1,982	121	4,775	85	36,027	2	1,132	15	18,387	39	15,121	141	Egypt
		370	84	769	74	94												Algeria and Tunis
		3,504	60	761	60	130									14	5,476		Other French Africa
		252	60	460			70	2,147										Italian Africa
		197	153	2,164	156	432												Liberia
		93	10	140	10	20											144	Madagascar
		9,553	863	27,037	189	866					2	1,002	1	1,162				Morocco
		6,691	2	34					24	9,738	7	5,640			12	4,662	590	Portuguese East Africa
		4,201	29	332	32	34												Other Portuguese Africa
		1,026													1	405		Spanish Africa
23	$29,555	$6,599,568	179,460	$2,262,606	132,717	$302,060	10,201	$231,940	867	$363,395	1,078	$736,655	435	$538,220	1,127	$457,677	$251,321	Total

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

December 17, 1927

Factory Activity Centers on New Model Production

PHILADELPHIA, Dec. 17—Except for the automobile companies that are starting production on new models, factory schedules are on a very moderate basis, a situation that may be expected to endure for some time. The normal seasonal slump in buying has been accentuated this year by a number of unusual factors, not the least of which is the introduction of the new Ford.

Automotive executives generally expected that business would be light until the national automobile shows are held. By that time the public will be fully cognizant of the offerings for 1928 and a widespread uncertainty that still exists will be cleared up.

Although there has been no intimation that price cuts of major importance will be made in the next few weeks, there seems little doubt that some such moves are looked for by the public, and this also tends to restrict purchases. As a matter of fact, sentiment among the manufacturers is strongly in favor of approximately the current price schedules, which are held to be low enough.

The downward trend in prices of raw materials entering into automobile construction, which aided price reductions earlier this year, has apparently been checked, while the added quality being put into cars further operates against lower prices.

I. H. C. Offers New Coupe for Specialty Salesmen

PHILADELPHIA, Dec. 13—A business coupe, specially designed for the needs of specialty salesmen and general service, has been announced by the International Harvester Co. of America. It is mounted on a standard International Harvester ¾-ton chassis, upholstered in fabric and furnished with a dome light. The top of the coupe down to the base of the windows is of fabric construction; the lower section is metal. Windows in the doors are equipped with regulators.

The body, which is of the low-side express type, is 61 in. long and 42½ in. wide, inside, with 13-in. high sides. A rail is mounted four inches above the side pieces providing means for roping shipments securely in place.

Budd Bendix Buyer

SOUTH BEND, Dec. 16—C. E. Budd has been made purchasing agent of the Bendix Brake Co. and O. C. Holaday has been promoted to service manager. Mr. Budd was formerly connected with the Chrysler and Rickenbacker organizations.

Norton Co. Buys Bethel-Player & Co.

WORCESTER, MASS., Dec. 15—The Norton Co. has purchased the entire capital stock of Bethel-Player Co., Inc., of Westboro, Mass., manufacturer of an extensive line of lapping machinery. The Norton company will make these products in its Worcester plant and market them through the Norton sales organization. Included in the line are crankshaft lapping machines, cylindrical and flat lapping machines, hole and cylinder lapping machines and toolroom bench laps, many of which are covered by patents.

The Bethel-Player company was organized in 1922 by Joseph N. Bethel and Sidney Player and was reorganized under its present name in June, this year. When the business is moved to the Norton plant many of the men in the Bethel-Player organization, including Mr. Bethel and Mr. Player, will continue their association as part of the Norton organization.

Collins Sells Interest as Chicago Distributor

CHICAGO, Dec. 14—R. H. Collins, president of the R. H. Collins Automobile Co., Chrysler distributor in the Chicago territory, has sold his interest to an organization to be known as the Chrysler Illinois Co. The management and personnel of the new company will be the same as before except that Mr. Collins will retire. W. C. Auble, who was general manager of the Collins company, continues as general manager. Mr. Collins has not made an announcement of his plans.

Holmes Joins Federal

DETROIT, Dec. 16—Milton A. Holmes has joined Federal Motor Truck Co. where he will assist M. L. Pulcher, president, in general sales work. Mr. Holmes recently has been vice-president of Relay Motors Corp. In 1914 Mr. Holmes entered the industry as sales manager of Republic. He resigned as vice-president of Republic in 1919 to organize the Transport Truck Co. of which he was president until 1925.

Dodge to Broadcast Victory Line Jan. 4

NEW YORK, Dec. 14—Dodge Brothers, Inc., is planning the public announcement of the new Victory Six over the National Broadcasting Circuit of 33 radio stations Jan. 4. Will Rogers will act as master of ceremonies from Hollywood and will introduce Bert Stone, speaking from Chicago, Paul Whiteman and his orchestra in New York and Al Jolson in New Orleans.

An audience of about 30,000,000 persons is expected to hear the program and announcement.

Propose Arbitration to Settle Automotive Cases

NEW YORK, Dec. 14—Appointment of a special commission to settle automobile accident cases by arbitration is soon to be recommended to Governor Smith. This recommendation is based upon the success of a commission which has reduced the number of cases in the New York Supreme Court from 2000 in May to 450 in November, according to Judge J. T. Mahoney speaking at an American Arbitration Association luncheon here today.

A. H. Swayne, vice-president of General Motors Corp., presided at the luncheon. Other speakers on automotive subject were George E. Stowe, vice-president of the Reo Motor Car Co. of New York; Lee J. Eastman, president of the Packard Motor Car Co. of New York, and W. E. Monk, commissioner of insurance of Massachusetts.

GM Truck to Furnish Truck Unit for LaFrance

NEW YORK, Dec. 15—General Motors Truck Co. has entered into a contract with American-LaFrance & Foamite Corp. to supply truck chassis with Buick engines on which the fire-fighting apparatus will be mounted by the LaFrance company. The object is to create a medium size fire-fighting unit which will be sold exclusively by the LaFrance company branches under the trade name of American-LaFrance-G.M.C.

Studebaker Ships Cargo

SOUTH BEND, Dec. 14—Studebaker Corp. of America has chartered the Steamship Eberstein to carry on its maiden voyage to Europe a shipment of 500 Studebaker and Erskine cars uncrated.

Car Tax Elimination is Voted by House

Increased Majority for Total Repeal Predicted When Final Action is Taken

WASHINGTON, Dec. 15 — Disregarding the administration's recommendations, the House today by a vote of 166 to 142 eliminated the 3 per cent excise tax on automobiles thus taking what might be regarded as one of the final steps in wiping off the Federal statute books a tax on the automobile industry imposed 10 years ago as a war emergency revenue measure.

The action of the committee of the whole came unexpectedly when Representative McLaughlin, Republican, of Michigan, offered an amendment to the ways and means committee's bill, to completely repeal the tax. The committee's recommendation was for repeal of half the automobile excise tax, thus leaving 1½ per cent in the new revenue bill which would have netted the government $33,000,000. The McLaughlin amendment, however, was for the complete repeal and will save automobile buyers a total of $66,000,000 next year.

The action of the committee as a whole must be affirmed by the House sitting as a legislative body and it is likely that before the end of this week the House will vote on the measure. This will be a record vote, each member's vote being recorded in the minutes of the body and it is regarded as certain by Mr. McLaughlin that the House as a legislative body will affirm its vote as a committee of the whole.

"If any change in the 166 to 142 vote at all is made, it will be in favor of the tax elimination, and it is my belief that the record vote will show even a larger majority in favor of the tax elimination," Mr. McLaughlin told a representative of *Automotive Industries*. He also predicted that the Senate's vote will be in accordance with the action of the House, pointing out that twice before the Senate has voted to repeal the tax, but were forced to leave it in the measure, by the House.

Refunds on 400,000 Cars

Another important phase of the bill is that the 52,000 automobile dealers and agents throughout the United States may obtain refunds on cars they have on their floors the day the bill finally becomes law. It is estimated that this action will remove the tax from approximately 400,000 cars in the hands of the dealers the day the bill is passed. The measure is effective the date the president signs it.

Complete repeal of the excise automotive taxes was attributed largely to the Republican support of the Michigan members of the House coupled with a scattering of Republican votes of the members of the agricultural committee, plus the Democrats who voted en masse for the complete repeal.

The vote was taken without debate under an agreement that any member of the House wishing to debate the question could have blanket authority to extend his remarks in the Congressional Record.

Republican leaders expressed much concern at the House's action in wiping out the entire tax. Representative Tilson, majority leader, from the dais of the floor shouted that the Democrats and the dissenting Republicans were wrecking the bill. "We are faced with too much reduction," he declared. "I desire to call the attention of the managers of the House to that effect."

Ajax and McClaren Fix Merger Terms

NEW YORK, Dec. 13—Ajax Rubber Co. is to acquire the McClaren Rubber Co. of Charlotte, N. C., by the exchange of 10 shares of Ajax common stock for each of the 12,000 outstanding shares of McClaren common, according to an announcement just made by H. L. McClaren, president of the McClaren company.

The 5000 outstanding preferred shares of McClaren stock of $100 par value are to be paid for in five-year, 8 per cent notes, callable at any time after two years at $115.

Mr. McClaren is expected to become president of the consolidated companies and J. C. Weston, president of the Ajax company, will become chairman of the board.

U. S. Rubber Purchase Private, States duPont

NEW YORK, Dec. 14—Irenee duPont, vice-chairman of the E. I. duPont de Nemours & Co., Inc., in a statement today said no investment has been made by the company in securities of the United States Rubber Corp., but "a few individuals, of whom I am one, have acquired a considerable block" as a private speculative investment. He said the purchase in no wise parallels the permanent investment in General Motors Corp. common stock made by the duPont company. The extent of the U. S. Rubber purchase was not disclosed.

Names New Buyers

BRIDGEPORT, PA., Dec. 16—L. T. Kratz has been made buyer of the Celoron Co. and Wallace McCarter buyer of the Diamond State Fibre Co., the promotions following the resignation of W. A. Knerr who is now secretary of the Norristown branch of the Pennsylvania Manufacturers' Association.

Founds Aeronautic Chair

CINCINNATI, Dec. 12—University of Cincinnati has been left a trust fund of $5,000 a year for five years by Jacob G. Schmidlapp, which will go to establish a chair of aeronautics.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.*

NEW YORK, Dec. 15—During the past week several uncertainties in the business situation have been removed by the publication of the annual messages of the President and the Secretary of the Treasury. Retail trade has improved considerably as the holiday season progresses, though distribution of goods at wholesale continues to lag. Average daily production of steel in November declined 5.7 per cent from the level of the preceding month and is now the lowest since July, 1925. Gross earnings of Class I railroads in October were 4.9 per cent less than a year ago, while gross earnings to date are 2.6 per cent below last year's figure.

FREIGHT CAR LOADINGS

Railroad freight car loadings in the week ended Nov. 26 again declined, numbering 840,803, as compared with 968,103 in the previous week and 937,844 in the corresponding period a year ago. Total loadings so far this year amount to 48,282,045 cars, as against 49,349,988 cars in the same period last year and 47,523,818 cars two years ago.

PETROLEUM OUTPUT

Production of crude petroleum decreased during the week ended December 3, average daily output for that period being 2,480,750 barrels, which compares with 2,498,350 barrels a week earlier and 2,388,800 barrels in the corresponding period a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices advanced to 146.1 last week, as against 145.7 in the preceding week and 145.7 four weeks earlier.

BANK DEBITS

Bank debits to individual accounts, as reported to the Federal Reserve Board for the week ended Dec. 7, were 25.2 per cent above the total of the preceding week and 27.4 per cent greater than the amount reported in the corresponding period of 1926.

FEDERAL RESERVE REPORT

For the same period the Federal Reserve banks reported that reserves rose $13,400,000, open market purchases $25,300,000, U. S. Government securities $56,400,000, note circulation $33,200,000 and deposits $14,100,000. Discounts declined $33,100,000. Member banks reported that in this period loans and discounts decreased $19,554,000, investments $26,212,000, net demand deposits $53,554,000 and borrowings from the Federal Reserve banks $26,493,000.

Time money and commercial paper rates were unchanged last week at 4 to 4¼ per cent and 3¾ to 4¼ per cent, respectively.

Mitchell Sees 1928 Big Automotive Year

National City Bank Head Says Industry Will Head Business Revival

DETROIT, Dec. 10—Addressing a large group of automobile manufacturers and financiers at a luncheon at the Detroit Athletic Club this week, Charles E. Mitchell, president of the National City Bank of New York, predicted that the country will enjoy continued prosperity and that it will be largely due to increased automobile production. The luncheon was given by Fred J. Fisher, vice-president of General Motors Corp.

"The year of 1928 will be one of unparalleled prosperity," said Mr. Mitchell. "The powerful influences of a sound credit situation, a return of Mr. Ford and other manufacturers to a normal output, continuance of large scale building will swing business back into its stride.

"The shutdown of the Ford industries had a wider influence on business in the past six months than perhaps Mr. Ford realizes or will admit. The country is wildly enthusiastic over the prospect of business revival which will follow the new Ford. Even with Mr. Ford's shutdown business was good and only 625,000 fewer cars were sold this year than last."

Mr. Mitchell asserted he did not want to give the impression that 1927 was a bad business year, but rather to convey that 1928 would be a better one,

"There is no bank credit inflation today. Time deposits have increased 32 per cent. Savings deposits comprise 80 per cent of bank funds and all signs spell safety for the future," declared Mr. Mitchell.

World Market Growing

During his address Mr. Mitchell went at length into a discussion of world markets and declared that every country will be the market for motor cars. "South America is a big prospective buyer. India is another, so are England, France and Italy. Sweden, Finland and Denmark were never in better condition. Belgium has recovered from the war and is back to work."

Among those attending as guests of Mr. Fisher were: Edsel Ford, William B. Mayo, Charles E. Sorenson, Roy D. Chapin, Roscoe B. Jackson, Charles D. Hastings, DuBoise Young, J. B. Graham, Robert C. Graham, Martin L. Pulcher, Walter O. Briggs, D. B. Lee, L. A. Young, William Robert Wilson, C. F. Kettering, W. S. Knudsen, A. R. Glancy, I. J. Reuter, E. T. Strong, M. L. Prentis, Paul W. Seiler, Charles T. Fisher, Lawrence P. Fisher, William A. Fisher, Edward F. Fisher, Alfred J. Fisher, Frederick J. Haynes, Howard Fisher, Robert C. Shields and Clarence R. Bitting.

Michigan is Third as Exporting State

WASHINGTON, Dec. 14—Because of the concentration of the automobile industry in Michigan, that state ranked third in export trade during the second quarter of this year, according to figures just compiled by the U. S. Department of Commerce.

Total exports from Michigan for the April-June period were $94,463,076. Of this sum $45,345,046 were passenger cars; $18,270,899 automobile parts; $12,115,035 trucks and buses, and $3,002,563 tractors. The second quarter this year shows a gain of $26,805,000 over exports for same period last year. Ohio ranked ninth, exporting during the April-June period a total of $51,378,771. Of this sum, $7,343,001 was for tires, followed by automobiles, valued at $5,232,181.

Chrysler Consolidates Metropolitan Sales

NEW YORK, Dec. 12—Colt, Stewart & Foy, Inc., and the Simons Motor Sales Co., Chrysler distributors for New York City and Brooklyn, respectively, will consolidate under the name of Simons, Stewart & Foy, Inc., on Jan. 1. The present salesrooms and service stations of the two companies in Manhattan, Brooklyn and the Bronx will be maintained, and executive offices will continue at 1745 Broadway.

Guy O. Simons, present president of the Simons Motor Sales Co., will be president of the new company, and William D. Stewart and Byron C. Foy, vice-presidents of Colt, Stewart & Foy, will be vice-presidents of the new company. Austin Beam, secretary and treasurer of the Brooklyn company, will be secretary-treasurer of the new company.

William L. Colt, president of the New York company, will retire from active participation in business in New York, a move which he has been contemplating for some time. He will retain his interests in Colt, Birmingham & Brady, Inc., of Providence, Chrysler distributor for Rhode Island.

Victor Develops Process

CHICAGO, Dec. 12—The engineering staff of the Victor Mfg. & Gasket Co. has developed a hydro-bright annealing process by which copper is uniformly annealed so that no scale or discoloration occurs. The metal is more thoroughly annealed than formerly so that the copper now reaches the forming presses soft and ductile and forms without cranks or wrinkles.

Henry Ford Resigns Canadian Presidency

Edsel Ford Now Heads Two Companies—New Resignations From U. S. Concern

DETROIT, Dec. 12—Henry Ford has retired as president of the Ford Motor Co. of Canada, Ltd., and has been succeeded by Edsel Ford, who is also president of the American company. The father will continue active in the affairs of Ford of Canada, though retiring from the presidency.

There were no other changes among officials, W. R. Campbell continuing as first vice-president and treasurer; George E. Dickert as second vice-president, and P. W. Grandjean as secretary and assistant treasurer. These officers with Edsel Ford and P. E. Martin comprise the board of directors with the exception of Mr. Grandjean, who is not a member.

Two additional resignations from the Ford official family in Detroit became known this week. H. L. Leister has resigned as general auditor after a connection of 16 years. V. D. Overman has resigned as production superintendent of the Lincoln division.

Lansing Dealers Form Salvaging Subsidiary

LANSING, Dec. 12—A group of prominent Lansing automobile dealers have followed the example of dealers in a number of other large cities and have formed a corporation for the exclusive purpose of salvaging old automobiles. The corporation has been named the "Auto Salvage Co."

Old cars which are in bad condition and which have been acquired by member companies, and which ordinarily would be sold to junk dealers, will find their way to the salvaging yard. The company will also buy old cars from outsiders for the purposes of salvaging. The cars will be stripped and the used parts made available for sale. Materials which cannot be sold for use again will be sold as junk.

Factories Favor Scrapping

DETROIT, Dec. 10—It is understood that the plan of wrecking a certain number of old cars which was introduced by the Chevrolet Motor Co. this year, is gaining favor in the industry to such an extent that it will probably soon be adopted by other manufacturers.

Packard Completes Unit

DETROIT, Dec. 10—The Packard Motor Car Co. announces completion of building No. 21, which is the seventy-ninth in the group of structures which forms the Packard factory group. The new structure comprises 175,000 sq. ft. and brings Packard's total floor space to 3,200,000 sq. ft.

Chevrolet Widens Territorial Plans

New Sales Regions Opened at Atlanta and Dallas—Adds Truck Managers

DETROIT, Dec. 12—Chevrolet Motor Co. has made important changes in its field personnel, created new sales zones and regions and established better facilities for handling fleet and commercial car business. Besides the new sales zone at Detroit, another zone has been established at Knoxville, Tenn. The company has also established two new regions at Atlanta and at Dallas. The changes are designed to bring the factory organization into closer touch with the dealers, and will enable the latter to provide better service, quicker deliveries and generally improved facilities for the public.

The Knoxville zone will be established Jan. 1, with J. E. Johnson of the central office as sales manager. This brings the total number of zone sales offices in the country to 45, 10 of which were established this year.

In the new regional division, territory formerly making up three regions, has been reapportioned into five regions. The change resulted because of business growth in the original regions which exceeded the normal volume. Under the new plan the former Southeastern region with headquarters at Norwood, Ohio, is renamed the Midwest region. It contains the Louisville, Knoxville and Charleston, West Virginia sales zones.

The new region at Atlanta takes the name Southeastern region and will be under L. S. Costley, and embraces the Atlanta, Birmingham, Jacksonville, Columbia and Charlotte zones which formerly were part of the region at Norwood. In the Middle West region at St. Louis under A. W. L. Gilpin, the Denver zone is being transferred from the Pacific Coast region to the Middle West region while the Dallas, Houston, New Orleans and Oklahoma City zones are transferred from the Middle West region to form the new Southwestern region with headquarters at Dallas under Felix Doran, Jr. The Southwest region takes over the El Paso zone from the Pacific Coast region.

Zone Heads Changed

The following changes in zone sales managerships also were made Dec. 1. F. H. Knight from the home office to Richmond, Va., to succeed E. E. Jones. C. P. Fisken, formerly sales manager of Janesville zone, to Indianapolis, succeeding C. R. Lee, transferred to another General Motors division. P. A. Jerrue, formerly Denver sales manager succeeds Mr. Fisken, at Janesville. C. E. Omeara, formerly Houston sales manager goes to Denver, and G. H. Kavanaugh, formerly assistant sales manager of Little Rock zone becomes Houston sales manager.

Simultaneous with these changes was the announcement that commercial car and fleet managers are being added to the personnel of approximately half the zone sales offices. These additions were made necessary through the rapid growth of business of this type and with an expert commercial car and fleet maximum charge the company will be in a position to extend its service to business concerns.

French Manufacturers Issue Patriotic Appeal for Purchases of French Automotive Products

PARIS, Nov. 28 *(by mail)*—A patriotic appeal to the French public to buy only French automobiles has been issued by the Chambre Syndicale des Constructeurs, a body corresponding to the National Automobile Chamber of Commerce. The appeal is as follows:

To Frenchmen and friends of the automobile:

Do not forget that the automobile industry originated on French soil; that it was developed here and that its models have been copied by the whole world. Do not forget that the French automobile, of superior quality and moderate price, is built to suit French tastes and for French roads. Do not forget that the French automobile does not wear out, is flexible, elegant and is the cheapest to maintain on account of its low gasoline consumption, its low taxation, and its long life. Do not forget that its technical superiority has been proved by brilliant successes in events all over the world. Do not forget that the purchase of a French car brings you in contact with the manufacturer, and you can always be sure of his guarantee.

If certain foreign methods are praised, do not forget that attractive appearance will not replace essential qualities, and that French manufacturers have now taken steps to provide those features which pleased in certain foreign cars: body details, comfort, accessories.

Remember that it is more than ever your patriotic duty to purchase only those foreign goods which cannot be produced on French soil. For every foreign automobile brought into France an important quantity of gold has to exported and the country is thereby rendered poorer. The automobile industry has become one of the most important of French industries. It is an industry which promotes progress and generates well being, which provides a living for a large number of workers and could maintain still more. When purchasing an automobile or a truck, it is your duty and it is also your interests, to show confidence in the national industry.

Dodge Adds Steeldraulics on Four-Cylinder Line

DETROIT, Dec. 12—Dodge Brothers, Inc., is now equipping its four-cylinder line with Midland steeldraulic four-wheel brakes. No increase in price is made on the line, in fact a reduction of $25 on the de luxe sedan is simultaneously announced, this model now listing at $950.

Of the internal expanding type, the steeldraulic brakes adopted by Dodge Brothers have 12-in. drums, with a width of 2 in. for the lining. The four-wheel brakes provide an effective braking area of 142⅝ sq. in. The hand brake applies to the same shoes, all four-wheel brakes being actuated by the emergency lever.

Waukesha to Add Unit

WAUKESHA, Dec. 10—Contracts have been placed by the Waukesha Motor Co. for a factory addition estimated to cost about $75,000 with equipment. The building will be 60 x 418 ft., two stories, of brick and steel, and is expected to be completed early in January.

Germany Cuts Duty on Cars and Parts

WASHINGTON, Dec. 12—Tariff rates on automobiles, trucks, motorcycles and many parts are revised downward under the provisions of the German tariff act after Jan. 1, the new rates to be effective until July 1 when further revisions are scheduled.

The new rates on automobiles and trucks weighing 2200 kilos or less is 100 Reichsmarks per 100 kilos; 2200 to 3200, 75; over 3200, 70. Chassis with engines and bodies are dutiable at the same rates as for automobiles. Motorcycles are taxed 190 per 100 kilos, the same rate applying on adhesion couplings, change speed gears and casings therefor, and brake hubs for motorcycles.

The following parts of automobiles which have been dutiable at 140 Reichsmarks since Sept. 6, take a rate of 100 Reichsmarks per 100 kilos after Jan. 1, and a rate of 75 Reichsmarks after July 1: Frames, radiators, adhesion couplings, change speed gears and casings therefor, universal joints (cardan), differential gears and casings therefor, brake and steering gear.

Uruguay Increases Duty

WASHINGTON, Dec. 15—In addition to other existing import duties on automobiles into Uruguay, the U. S. Department of Commerce is advised by its representatives at Montevideo that, effective at once, there will be an additional 10 per cent duty assessed on all passenger cars imported into that country.

Men of the Industry and What They Are Doing

Nickerson and Smith Join Oakland Motor Car

Harry R. Nickerson has been appointed works manager of the Oakland Motor Car Co., resigning as superintendent of the Chevrolet engine plant, at Flint. Announcement is also made of the appointment of R. B. Smith as plant superintendent of Oakland. He also comes from Chevrolet's plant at Flint where he was master mechanic.

The appointment of Mr. Nickerson was to fill the vacancy at Oakland caused by the resignation of L. A. Blackburn. Soon after his retirement from the company, however, Mr. Blackburn returned as resident engineer of Oakland.

According to C. F. Barth, vice-president in charge of production of Chevrolet, Mr. Nickerson will be succeeded as superintendent of the engine plant by A. G. Dulliver, who has been night superintendent.

Mr. Nickerson has been with General Motors Corp. for 21 years. His first position was as a machine operator with the Buick Motor Co. in 1907. Mr. Smith has been master mechanic of Chevrolet for the past eight years.

Hastings Show Chairman

Charles D. Hastings, chairman of the board of Hupp Motor Car Corp., has been named chairman of the passenger car show committee of the National Automobile Chamber of Commerce, succeeding H. M. Jewett. A. H. Swayne, vice-president of General Motors Corp., was named a member of the committee which includes also F. C. Chandler, president of Chandler-Cleveland Motors Corp.

Kimball Advertising Manager

Norman F. Kimball has been appointed manager of advertising of the American-LaFrance Foamite Corp. Mr. Kimball was successively assistant hydraulic engineer at Underwriters' Laboratories in Chicago, chief engineer of the former O. J. Childs Co., and assistant general sales manager of the Foamite-Childs Corp. He holds the engineering degree of fire protection engineer by the Armour Institute of Technology.

Bills Ford Service Manager

Harry Bills has been named general service manager of Ford Motor Co., succeeding E. P. Hobart, who resigned recently. Mr. Bills has been associated with Ford Motor Co. in a number of capacities for several years.

Connors Succeeds Watson

J. H. Connors has succeeded John J. Watson as president of the Republic Rubber Co. of Youngstown, Ohio. Mr. Watson will serve as chairman of the board. Mr. Connors has been in the rubber industry more than 20 years.

Firestone Engages Scientist for Liberia

The appointment of Dr. Millard F. Ottman, noted ethnologist of the National Museum, Washington, to the post of resident physician of the Firestone plantations in Liberia, was announced this week by the Smithsonian Institution. He will specialize in treatment of fever and tropical diseases on the West Coast in connection with the company's development of its rubber holdings in Liberia.

Tozzer Leaves Niles Tool

Brent A. Tozzer, New York sales manager of the Niles Tool Works Co., has resigned, effective Dec. 31. Mr. Tozzer entered the machine tool industry in 1901 with the Lodge & Shipley Machine Tool Co. In 1908 he joined the Niles-Bement-Pond Co. and Pratt & Whitney Co. He will announce his new plans about Jan. 1.

James Milwaukee Speaker

William S. James, head of the Studebaker research engineering department, was the guest of honor at the December dinner meeting of the Milwaukee Section, Society of Automotive Engineers at the Athletic Club. He spoke on Research in the Automotive Industry.

Runge Addresses Engineers

How one industry is helping to relieve the world of friction was outlined at a recent meeting of the Engineering Institute of Canada, when R. F. Runge, of New York, vice-president of SKF Industries, Inc., delivered an address on Manufacture of Ball and Roller Bearings.

General Patrick Retires

Maj. Gen. Mason M. Patrick has retired as chief of the air corps of the U. S. Army and has been succeeded by Brig. Gen. James E. Fechet, present assistant, who is elevated to the rank of major general. General Patrick's retirement is by statute.

J. Howard Rees Resigns

J. Howard Rees has resigned as export manager of the Hudson Motor Car Co. He had been associated with Hudson for nine years. He has not announced his plans for future activities.

Wilkinson Joins Smith

Zeno C. Wilkinson, sales manager of the Youngstown Pressed Steel Co., Warren, Ohio, has resigned to become vice-president and director of the Peter Smith Heater & Mfg. Co., Detroit.

Wright Grants Contracts for European Production

Charles Lawrence, president of Wright Aeronautical Corp., back from a two months' trip abroad, announced that the Polish government had contracted for the right to manufacture the Wright Whirlwind engine in Poland, and that the Skoda Co. of Czechoslovakia had purchased similar rights. These contracts cover Central Europe and negotiations are under way in France for the right to manufacture the engines in Western Europe.

"While the company will benefit in its income through these contracts," Mr. Lawrence said, "the important thing is that it shows that American airplane engines are gaining in prestige abroad."

Mr. Lawrence said, regarding domestic business, that earnings this year would be close to $4 a share on the common stock, and that he expected much better results in 1928. He said the company was expanding its manufacturing facilities and less than one-third of its business was now going to the government.

Smith Named Works Manager

Promotion of George W. Smith, Jr., formerly technical assistant to the vice-president and general manager of the White Motor Co., to the position of works manager, has just been announced by Walter C. White, president. Mr. Smith succeeds R. M. Hidey, who has resigned.

Green Leaves M.&A.M.A. Post

W. E. Green, former secretary of the Automotive Manufacturers Association, who has been serving as Chicago field secretary of the Motor & Accessory Manufacturers Association since the consolidation of these two organizations, has resigned, to devote his full time to his own business interests with the International Stamping Co.

Joyce Joins Chance Vought

Temple N. Joyce has been appointed manager of sales and service of the Chance Vought Corp., Long Island City, N. Y. Mr. Joyce is an active aviator and has been special sales and engineering representative in Washington, D. C., of the Curtiss Aeroplane & Motor Co., Inc. He will take over the sales activities formerly handled by Mr. Chance Vought.

Reeves to Address Dealers

Alfred Reeves, general manager of the National Automobile Chamber of Commerce will be the principal speaker at the banquet of the eighth annual convention of the Michigan Automotive Trade Association, which will be held rubber industry more than 20 years.

Varied Topic List Arranged by S.A.E.

Subjects at Annual Meeting Will Relate Principally to Passenger Car Work

NEW YORK, Dec. 12—The program for the annual meeting of the Society of Automotive Engineers, to be held in Detroit, Jan. 24 to 27, includes a diversity of subjects relating principally to research and engineering problems associated with passenger cars. Among the speakers at the engine sessions on the second day are H. A. Huebotter, who will discuss Aluminum Alloy Pistons; H. M. Jacklin, Advantages of Multiple Ignition, and P. L. Morgan, Some Aspects of Supercharging.

Addresses at the research session Jan. 26 include Dr. Graham Edgar on "Comparison of Methods of Measuring Knock Characteristics of Fuels"; H. K. Cummings, "A Detonating Survey"; R. Best and J. O. Eisinger, "Some Factors in Engine Acceleration"; H. H. Allen, "Headlighting Progress"; Dr. C. Francis Jenkins, "Use of High Speed Motion Pictures"; Dr. R. E. Wilson, "Oil Viscosity at Low Temperature and Its Relation to Ease of Starting"; O. C. Bridgeman and Dr. C. S. Cragoe, "Interpretation of the Distillation Test of the American Society for Testing Materials."

Addresses at the heavy-duty engine session on the last day are by O. D. Treiber, "High-Speed Diesel Engines," and H. L. Horning, "Industrial Engines."

T. H. Wickenden will present a paper on "Research on Hardness and Machineability of Cast Iron" at the production session on Jan. 27, and Henry Chandler will present a discussion on the "S.A.E. Physical-Property Charts for Alloy Steel" at the standards session, Jan. 24.

Close Lincoln Highway Gap

SAN FRANCISCO, Dec. 12—Assuring the completion of another transcontinental motor route, the Lincoln Highway Association has officially adopted the plan of the committee of fifteen for closing the gap that has existed in the Lincoln Highway between Nevada and Utah for many years. This agreement ends a controversy which started in 1918. The new and accepted route runs from Ely, Nev., to the Victory Highway at Wendover, Utah, thence to Salt Lake City, whence the present Lincoln Highway leads on east. Construction is to be started at once.

White Opens 3 Branches

CLEVELAND, Dec. 12—New branch sales and service buildings will be opened by the White Co. in Providence, R. I., Hartford, Conn., and Toronto, Ont., this month and next. The Providence building will have 25,500 sq. ft. of floor space, the Toronto building 24,000 sq. ft. and the Hartford building 23,000 sq. ft. All three buildings provide increased facilities and more convenient locations for White owners. New buildings in Syracuse and Duluth will be opened in February and March.

Meetings and Events Scheduled for Week of New York Automobile Show

FRIDAY, JAN. 6

Stutz Motor Car Co., Salesmen's and Dealers' Meeting, Branch Office ..... 8.00 p. m.

SATURDAY, JAN. 7

Hupp Motor Car Corp., Luncheon and Meeting, every day, Commodore Hotel.

Studebaker Corp. of America, Dinner, Hotel Plaza..... 7.00 p. m.

MONDAY, JAN. 9

National Automobile Dealers Ass'n, Eastern District Convention, Commodore Hotel. .....10.00 a. m.

Oakland Motor Car Co., Meeting, Roosevelt Hotel..... 1.00 p.m.
Banquet, Roosevelt Hotel. 6.30 p.m.

Rubber Association of America, Inc., Meeting and Luncheon, Commodore Hotel .....10.00 a. m.
Dinner, Commodore Hotel. 7.00 p. m.

John N. Willys' Luncheon to Trade and Newspapermen, Biltmore Hotel .....12.30 p. m.

TUESDAY, JAN. 10

National Automobile Chamber of Commerce, Banquet, Commodore Hotel ..... 6.30 p. m.

WEDNESDAY, JAN. 11

Auburn Automobile Co., Luncheon, Commodore Hotel ..... 1.30 p. m.

Cadillac Motor Car Co., Dinner, Hotel Astor ..... 7.00 p. m.

Chevrolet Motor Co., Business Meeting, Mecca Temple ..... 1.30 p. m.
Banquet, Commodore Hotel ..... 6.30 p. m.

H. H. Franklin Mfg. Co., President's Luncheon, Commodore Hotel ..... 1.00 p. m.

Gardner Motor Co., Luncheon and Meeting, Hotel Belmont ..... 1.00 p. m.

Motor & Accessory Manufacturers Ass'n, Annual Meeting, Hotel Astor..... 2.30 p. m.
Banquet, Hotel Astor..... 7.00 p. m.

Paige-Detroit Motor Car Co., Luncheon, Roosevelt Hotel.....Noon

Peerless Motor Car Corp., Dinner, Commodore Hotel. 6.30 p. m.

THURSDAY, JAN. 12

Society of Automotive Engineers, Dinner, Hotel Astor ..... 6.30 p. m.

Overseas Automotive Club, Dinner, Hotel Astor..... 6.30 p. m.

Seamless Steel Tube Co. Taken Over by Appleton

MILWAUKEE, Dec. 10—A group of business men of Appleton, Wis., has organized a new $100,000 corporation under the name of the Appleton Steel Tube Co., to take over and resume the operation of the plant of the Seamless Steel Tube Co., which discontinued operations earlier in the year. The plant is being overhauled and production is expected to be under way by Jan. 1 or Feb. 1. L. E. Johnson, now in Pennsylvania, who was in charge of the plant when the former owners discontinued, has accepted the position of general superintendent.

It is intended to manufacture seamless tubing from one-half to 3 in. in diameter.

Gets Alloy Contracts

DETROIT, Dec. 10—General Alloys Co. has obtained important contracts from International Harvester Co. and Dodge Brothers, Inc., which with orders already in hand from other automobile, railroad and public utilities companies should keep its plants at capacity for months.

Uniform Traffic Code Now Being Drafted

NEW YORK, Dec. 10—At the meeting of the Committee on Municipal Traffic Ordinances and Regulations at the National Conference on Street and Highway Safety held in Washington this week, a tentative code was placed in the hands of the drafting committee for the promulgation of uniform municipal traffic ordinances.

The report of the drafting committee is expected to be ready within another 10 days and automotive manufacturers and dealers whose business might be affected by the adoption of such a code should get in touch with the committee, who will send them copies just as soon as it is prepared. Another conference is to be held this winter or early in spring, when the suggestions received on the present draft will be considered.

The salient points of this code brought out in debate at the conference, will include some of the following regulations:

"It is recommended that left hand turns be made only on green light; that all cars cars come to a complete stop before making a right-hand turn; that cities making exceptions to this code post the roads where the exceptions are made conspicuously; that soliciting of rides be forbidden, and that parking for over 30 min. between the hours of 2 and 6 a. m. be forbidden.

Airplane Engineers Ask U. S. to Prepare Rules on Design

Proposal Made to Department of Commerce at Aviation Meeting Would Guide Development of Structurally Trustworthy Craft—Airport Management Discussed

WASHINGTON, Dec. 10—Engineering representatives of the aircraft industry recommended this week that the Department of Commerce prepare a set of rules embodying the requirements for structurally airworthy planes so that the industry at large might be guided on new designs. The recommendation was made at the meeting held here under Department of Commerce auspices to discuss the future of aviation and the necessity for changes in the regulation of air traffic and commerce. W. P. MacCracken, Jr., assistant secretary of commerce for aeronautics, was chairman of the meeting.

The committee of engineers which recommended the development of a set of rules covering design represented Ford Motor Co., Advance Aircraft Co., Alexander Industries, Inc., G. Elias & Bro., Inc., Fairchild Airplane Co., Hamilton Aero Mfg. Co., Ireland Aircraft, Inc., Junkers Aircraft Corp., Kreider-Reisner Aircraft Co., E. M. Laird Co., Overcashier Aircraft Co., Pitcairn Airplane Co., and Swallow Mfg. Co.

Regulation of aviation schools and their classifications were urged. Figures were submitted showing that the cost of 10 hours' training in this country is from $350 to $500, compared with $2,700 for 15 hours training in Germany and $900 for 15 hours in Japan.

More than a score of nationally known insurance companies were represented, expressing their views as to insurance problems incident to aviation.

The problems of administration and management of airports were discussed exhaustively, primary attention being paid to the Department of Commerce's proposed regulations governing the rating of air navigation facilities.

Seek Additional Airports

The major portion of the department's problem, it was stated, deals primarily with inspection and airports and on this subject the following recommendations were made by the committee of the Aeronautical Chamber of Commerce: (1) That the department continue its efforts for the establishment of airports in all large cities and over prescribed routes; (2) that the department give more detailed information to pilots as to facilities at all airports; (3) that the department refrain from publishing costs on airport construction or equipment, because of the widely varying conditions; (4) that all airports in the United States be equipped for night flying and made available for use 24 hours per day; (5) that the Weather Bureau be commended for its efforts and that added facilities be provided for better weather reports and that arrangements be made to communicate hourly weather reports to airports having managers, and (6) that airport managers be deputized to enforce airport and flying regulations.

President Coolidge, in a letter to the delegates, read by Secretary Hoover, urged the necessity of an international civic aviation conference and exhibit, which he suggested be held here next December, in commemoration of the twenty-fifth anniversary of the first flight, made by Orville Wright, in a power-driven heavier than air machine.

Col. Charles A. Lindbergh, addressing the delegates, spoke on "Safety in Aviation." Its progress, he declared, depends on its safety. "Speed and carrying capacity are of great importance in competing with other forms of transportation but without safety and reliability, aviation can never attain its rightful position in world commerce, can never become truly great until it has the full confidence of the public. In order to gain that confidence we must assure the user of aircraft of both reliable equipment and experienced personnel for its operation. The layman cannot decide which planes are safe or whether the personnel is skilled. It must follow that the Department of Commerce must rigidly inspect and regulate the operation of aircrafts which are for hire."

Accidents Show Decrease

Figures were submitted showing the number of accidents during the first 10 months of this year, which compared with previous figures show that aviation is becoming increasingly free from fatalities. During the January-October period this year there was a total of 165 accidents in which but 19 licensed planes crashed. Thirty-three licensed pilots figured in mishaps.

An analysis of the causes for the accidents showed that 23 were due to structural defects, 41 mechanical, 79 pilots, 9 weather and 7 unsafe fields of harbors, the other 7 being due to other causes. Figures submitted by Dr. Frederick Hoffman, statistician for the Prudential Life Insurance Co., showed that during 1926 there was but one fatality in connection with the flying of the U. S. mails, despite the fact that 2,500,000 miles were flown.

Naval Aviator Gets Schiff Flying Award

WASHINGTON, Dec. 15—The Herbert Schiff Memorial trophy was presented by President Coolidge this week to Lieut. Arthur Gavin, U. S. N., for the feat of having flown the most hours during the last fiscal year without an accident of any kind. Altogether during the 12 months' period he flew 865 hours. The record was cited by the President as evidence of the strides which aviation is making from a safety point.

Rodger Heads NSPA Aeronautical Committee

DETROIT, Dec. 12—L. T. White, president of the National Standard Parts Association, has appointed an aeronautical committee comprising three manufacturer and three jobber members. The manufacturer members are: David W. Rodger, Federal-Mogul Corp., chairman; C. C. Secrist, Victor Mfg. & Gasket Co., and J. C. Yordon, Laminated Shim Co., Inc. The jobber members are: V. W. Olsen, Automotive Service Co., St. Paul; Dan H. Willis, Willis Co., Canton, Ohio., and A. L. Treitman, American Motor Specialties Co., Newark, N. J.

An aviation questionnaire was recently broadcast to the membership of the N.S.P.A. by E. P. Chalfant, executive vice-president, as a means of gathering information from members who are supplying parts to airplane manufacturers. Some members reported they had been supplying parts for aviation engines since 1916, others that they had entered the field since the war and a number reported they have plans under way for adoption of their products to meet airplane requirements.

Aircraft Exports Gain

WASHINGTON, Dec. 10—American exports of aircraft, engines, and parts amounted to $86,601 in September, bringing the total wholesale value for the first nine months of this year up to $1,096,956, according to figures just announced by the U. S. Department of Commerce. The exports for the current year are approximately $60,000 more than for the whole calendar year of 1926.

Gets Navy Plane Award

WASHINGTON, Dec. 15—The Consolidated Aircraft Corp. of Buffalo, was this week awarded a contract by the Navy Department for eight airplanes and spare parts at a cost of $68,830. These are training planes equipped with Wright Whirlwind air-cooled engines of the type now used at the Navy's air station.

Steel Rollers Seek Higher Price Levels

Competition for Orders, However, Brings Concessions — Sheet Market Unresponsive

NEW YORK, Dec. 15—Efforts to lift prices to moderately higher levels continues to be the outstanding task of steel producers. It is not so much pressure on the part of steel buyers that makes this a difficult job as a disposition on the part of many mills to let no chance for improving their backlog slip through their fingers, even though they complain vociferously of the concessions which they have to make to beat out their competitors.

The change in the basing point on steel bars and other heavy rolled products by the largest independent from f.o.b. Pittsburgh to f.o.b. mill has so engrossed the attention of the trade that the immediate price changes caused by the announcement came in for relatively little notice. So far as Detroit territory is concerned, the change is not of great importance, but further price advances are predicted.

The sheet market has not yet responded to the recent announcement of a West Virginia mill which took the lead in striving to establish higher price levels. Quite a few sheet rollers appear to be ready to fall in line but hesitate until the market gives more concrete evidence of supporting such an advance. There is much talk of finishers of automobile sheets restoring the 4.15 cents, Pittsburgh, price in the near future. It is the impression among purchasing agents, however, that any and all price advances will carry sufficient notice to enable consumers to cover their requirements for the first quarter of 1928 at old prices.

As there seems to be very little possibility of the market slipping further, it is quite likely that automotive consumers will anticipate their first quarter 1928 requirements somewhat more freely during the next three or four weeks. First quarter orders for bolts and nuts are being placed at 70 per cent off the list.

Pig Iron—A slightly stronger tone is noted in some of the markets, but automotive foundries are not showing much interest.

Aluminum—Latest import statistics show that the movement of metal from Europe and Canada has tapered off, October shipments from abroad aggregating only 1,536,159 lb., the lowest record for any one month in two years.

Copper—A slightly better demand for copper products and automotive brasses is reported by rolling mills.

Chrysler Adds Roadster

DETROIT, Dec. 10—Chrysler Sales Corp. announces the addition of a new sport roadster with rumble seat to the Chrysler "72" models. The car lists at $1,595. Among the features are folding type windshield with nickel-plated stanchions, drum type nickel-plated headlamps, nickel-plated tail lamp, chrome plated cowl band, with nickel-plated side lamps, golf compartment in side of body, opening with the same key as the rear deck; floating type front seat and special nickel-plated slat iron construction of top, which allows unusually compact fold. Twin cushions of the saddle spring type are used.

G.M.D. to Hold 30 Jobber Conferences

CHICAGO, Dec. 9—A series of jobber executive conferences to be held in 30 cities of the United States and Canada beginning about Jan. 15, and closing about May 30, is announced by Harry G. Moock, managing director of the Greater Market Development of the Automotive Equipment Association.

Cities have been selected in which jobber executives can convene with a minimum of traveling and loss of time from their businesses. Every A.E.A. jobber, in this way, can attend at least one of the conferences.

Each conference will present an opportunity for all jobbers present to discuss their problems and possible solutions thereof. Talks by four G.M.D. executives and the zone manager of the territory in which the conference is held will precede these discussions. Mr. Moock will preside at each meeting.

Henry Kirkland will discuss accessories and supplies, Martin E. Goldman, shop equipment and small tools, and M. D. Graham will speak on service parts.

Carbon Seeks Vim Plant

MILWAUKEE, Dec. 10—The Carbon Engineering Co., is negotiating for the purchase of the plant of the former Vim Tractor Co. at Slinger, Wis., which has been idle several years. The Carbon company, which is capitalized at $100,000, manufactures carbon brushes and other specialized parts for motors and generators and is planning a substantial increase in capital if the Vim plant becomes its property.

Financial Notes

Federal Motor Truck Co. reports net profits for the first nine months of this year as $532,514 after depreciation and Federal taxes, equivalent to $1.20 a share on 441,524 shares of no par stock. This compares with $1,319,477, or $3.29 a share, on 400,000 shares for the corresponding period of last year. Net profit for the September quarter was $208,711, or 46 cents a share.

American Car & Foundry Co. and subsidiaries report net income for the six months ended Oct. 31 as $2,876,117, equal after preferred dividends to $3.04 a share of 600,000 shares of common stock. This compares with $2,896,700, or $3.08 a share for the same period last year.

Paige-Detroit Motor Car Co. has declared the regular quarterly dividend of $1.75 a share on the first preferred stock, payable Jan. 2 to stock of record Dec. 15. Dividend action on the second preferred stock was deferred upon the recommendation of the Graham Brothers.

Chicago Stock Exchange has listed 209,548 shares of no par capital stock of the Campbell, Wyant and Cannon Foundry Co. The company, located at Muskegon, Mich., is a large producer of engine blocks for passenger automobiles, trucks and tractors.

Chandler-Cleveland Motors Corp. has omitted the regular quarterly dividend of 62½ cents due on preferred stock. President F. C. Chandler said this action would tend to improve operations of the business.

Borg & Beck Co. has declared a 20 per cent stock dividend, payable Jan. 12 to stock of record Dec. 3, to cover the recent authorization for capital increase from 125,000 to 200,000 shares.

Timken Detroit Axle Co. has declared an extra dividend of one-half of 1 per cent and the regular quarterly dividend of 1½ per cent, both payable Jan. 1 to stock of record Dec. 20.

European Aerial Pleasure Cruise Organized for 35-Day Tour London to Mediterranean

LONDON, Nov. 28 (*by mail*)—It is announced that Imperial Airways is organizing what is termed the world's first aerial pleasure cruise, viz.: a 35-day tour from London to the south of France, Northern Africa, Spain and Italy, and back to London. The machine to be used is an Armstrong-Whitworth "Argosy" with three "Jaguar" engines. It carries 12 passengers in addition to the crew. Meals and light refreshments will be served en route in the passengers' cabin. A radio transmitting and receiving set is installed. Each passenger will be allowed to take 60 lb. of luggage, and arrangements are being made for additional containers to be picked up at Algiers and Naples if sent ahead.

The cost of the tour, during which 5500 miles will be flown, will be £547, including hotel accommodation, automobile tours from stopping places, and incidentals. It is pointed out that participants will have the unique advantage of views from aloft of localities they are about to visit, or have visited, the maximum amount of time on land for expeditions to places of interest, and daylight travel throughout, the aerial tourists spending each night at some hotel.

The following is the list of landing places:

Paris, Bordeaux, Biarritz, Barcelona, Seville, Tangier, Casablanca, Fez, Oran, Algiers, Tunis, Naples, Rome, Venice, Pisa, Marseilles.

Six-Wheel Vehicles Discussed by S.A.E.

SAN FRANCISCO, Dec. 12—Design and Operation of Six-Wheel Vehicles was the subject of an exhaustive paper presented by Arthur H. Lacey, consulting engineer of Los Angeles, before the northern California section of the Society of Automotive Engineers, at the December meeting and banquet at the Engineers' Club in this city. Mr. Lacey divided his address into four sections—six-wheel drive, six-wheel attachment, dual tire on rear, and tractors. Motion pictures and slides were used to illustrate the talk. W. S. Crowell, secretary of this section, has sent out a questionnaire to all members in an effort to obtain majority opinion on programs and subjects of addresses desired by the majority of the membership for the dinners each month.

New England Section Meets

BOSTON, Dec. 10—With George A. Rounds, of the Vacuum Oil Co., New York, Prof. W. H. McAdams, Massachusetts Institute of Technology, and George Calingaert, Ethyl Gasoline Corp., New York, as the speakers, the December meeting of the New England Section, Society of Automotive Engineers, here proved one of the most interesting ever held.

Mr. Rounds presented slides showing oil in various stages when it is broken down. He stressed the need of a careful check up on dilution, particularly from water.

Professor McAdams gave a talk on fuel going into details of possible substitutes. He said that despite the over production of oil now there is no certainty that the supply will last forever.

Mr. Calingaert gave a demonstration of substances that take the knock out of fuel, explaining the process with slides.

Larrabee Buys Plant

NEW YORK, Dec. 13—The Larrabee Motor Corp. of Delaware, recently organized to succeed the Larrabee Motor Truck Co., Inc., of Binghamton, N. Y., has purchased the former Fiat Motor Co. plant at Poughkeepsie, N. Y.

Coming Feature Issues of Chilton Class Journal Publications

Jan. 1—National Shows Number—Automobile Trade Journal.

Jan. 5—National Shows Issue—Motor Age.

Feb. 18—Statistical Issue—Automotive Industries.

Oil Institute Approves Limiting Property Rights

CHICAGO, Dec. 10—The American Petroleum Institute went on record at its convention here this week favoring a radical limitation of private property rights in the interest of national welfare and defense. The industry proposes to surrender private interests and to submit to regulations that will insure a more reliable and abundant supply of fuel.

The gas conservation committee endorsed the ideas of unit operation of oil pools as advanced by Henry L. Doherty and government scientists and geologists.

Rome Gets Fifth Congress

NEW YORK, Dec. 10—Prices for the World Motor Transport Congress is to be held in Rome during September, 1928, by special invitation of Benito Mussolini. The invitation was extended by Senator Silvio Crespi, president of the Royal Italian Automobile Club at the fourth annual congress held in London. Acceptance of the invitation has been announced by the Bureau Permanent International des Construction d'Automobile, with which the American industry is affiliated.

Ford British Prices

NEW YORK, Dec. 5—Prices for the new Ford cars in Great Britain range from $600 for the chassis to $1,075 for the Fordor sedan. The roadster is $725, touring car $750, coupe $925, Tudor sedan $925, and sport coupe $1,025.

Studebaker Brings Dealer Group to U.S.

SOUTH BEND, Dec. 10—According to H. S. Welch, manager of export sales of the Studebaker Corp. of America, 50 of the largest Studebaker distributors in Europe will arrive in New York early in January to begin an extensive study of American methods of automobile merchandising. These European representatives will study Studebaker dealer organizations in the United States, and will visit the Studebaker factories.

The visitors will first inspect the National Automobile Show in New York and will attend the annual Studebaker banquet. They will then go to South Bend for a trip through the Studebaker plants, research laboratories, and proving ground. They will then go to Detroit to see other Studebaker plants.

Factory officials point out that the visit of these European dealers is a reflection of the increased business anticipated by Studebaker in Europe next year, as well as an outgrowth of this year's record breaking increase in Studebaker's export trade.

Buick Completes Plan of Showing Dealers Plant

FLINT, Dec. 17—The elaborate program of dealer entertainment which has occupied four days of every week since the middle of September, was concluded this week by Buick Motor Co.

Buick dealers have been coming to Flint from all parts of the country, at the rate of 250 a week. Each party has spent one day inspecting the Buick factory and another day at the General Motors Proving Grounds near Milford. The visit was unique in that the great majority of Buick's dealer organization of more than 3000 made the trip to the factory.

Gear Association Moves

CLEVELAND, Dec. 10—Offices of the American Gear Manufacturers Association have been moved to 3608 Euclid Ave., this city, where larger and more centrally located headquarters are available.

Calendar of Coming Events

SHOWS

All Western Road Show, Los Angeles, March 7-11
American Road Builders Association, Public Auditorium, Cleveland..Jan. 9-13
*Boston, Mechanics Bldg.....March 10-17
*Chicago, National Automobile Chamber of Commerce, Coliseum, Jan. 28-Feb. 4
International Aircraft Show, Berlin, March 23-April 11
*New York, National Automobile Chamber of Commerce, Grand Central Palace .....Jan. 7-14
Rio de Janeiro.....May 3-13
Salon, Automobile Salon, Inc., Hotel Drake, Chicago .....Jan. 28-Feb. 4
Salon, Automobile Salon, Inc., Hotel Biltmore, Los Angeles.....Feb. 11-18
Salon, Automobile Salon, Inc., Palace Hotel, San Francisco..Feb. 25-March 3
United States Good Roads Show, Des Moines .....May 28-June 1

*Will have special shop equipment exhibit.

CONVENTIONS

American Road Builders' Assn., Hotel Hollenden, Cleveland .....Jan. 9-13
American Road Builders' Association, Banquet, Hollenden Hotel, Cleveland .....Jan. 11
Automotive Equipment Association, Grand Hotel, Mackinac Island, June 10-16
National Automobile Dealers Ass'n, Annual Meeting, Palmer House, Chicago. .....Jan. 31-Feb. 2.
National Battery Mfrs. Assn., Chicago, Feb. 15-16
National Foreign Trade Council, Houston, Texas .....April 25-27
United States Good Roads Association and Bankhead National Highway Association, Des Moines.May 28-June 1

S. A. E.

National

Detroit, Jan. 24-27—Annual Meeting.

Sectional

Cleveland, Dec. 19—Research—Dr. H. C. Dickinson.